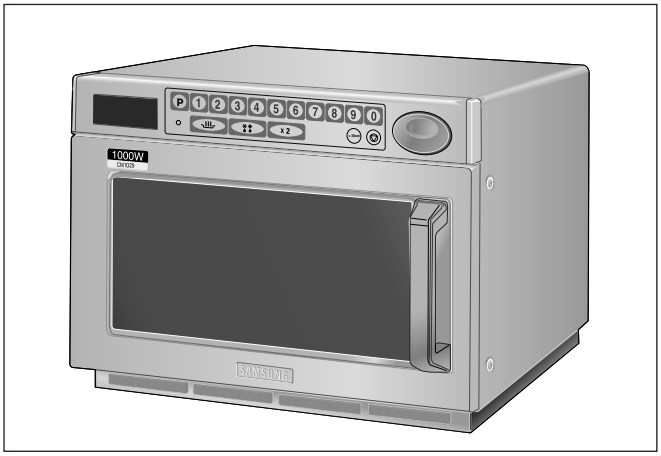
SAMSUNG

MICROWAVE OVEN

CM1019 / CM1029

SERVICE Manual

MICROWAVE OVEN



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PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:
  (1) Interlock operation,
  (2) proper door closing,
  (3) seal and sealing surfaces (arcing, wear, and other damage),
  (4) damage to or loosening of hinges and latches,
  (5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A microwave leakage check should be performed on each oven prior to release to the owner.

1. Precaution

Follow these special safety precautions. Although the microwave oven is completely safe during ordinary use, repair work can be extremely hazardous due to possible exposure to microwave radiation, as well as potentially lethal high voltages and currents.

1-1 Safety precautions (⚠)

1. All repairs should be done in accordance with the procedures described in this manual.

2. Microwave emission check should be performed prior to servicing if the oven is operative.

3. If the oven operates with the door open : Instruct the user not to operate the oven and contact the manufacturer and the centre for devices and radiological health immediately.

4. Notify the Central Service Centre if the microwave leakage exceeds 5 mW/cm^2.

5. Check all grounds.

6. Do not power the microwave oven from a "2-prong" AC cord. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.

7. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.

8. Make sure that there are no cabinet openings through which people--particularly children--might insert objects and contact dangerous voltages. Examples: Lamp hole, ventilation slots.

9. Inform the manufacturer of any oven found to have emmission in excess of 5mW/cm^2. Make repairs to bring the unit into compliance at no cost to owner and try to determine cause.
   Instruct owner not to use oven until it has been brought into compliance.

10. Service technicians should remove their watches while repairing an microwave oven.

11. To avoid any possible radiation hazard, replace parts in accordance with the wiring diagram. Also, use only the exact replacements for the following parts: Primary and door sensing switches, interlock monitor switch.

12. If the fuse is blown by the Interlock Monitor Switch: Replace all of the following at the same time: Primary and door sensing switches, as well as the Interlock Monitor Switch. The correct adjustment of these switches is described elsewhere in this manual. Make sure that the fuse has the correct rating for the particular model being repaired.

13. Design Alteration Warning:
    Use exact replacement parts only, i.e., only those that are specified in the drawings and parts lists of this manual. This is especially important for the Interlock switches. Never alter or add to the mechanical or electrical design of the microwave oven. Any design changes or additions will void the manufacturer's warranty.

14. Always unplug the unit's AC power cord from the AC power source before attempting to remove or reinstall any component or assembly.

15. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.

16. Some semiconductor ("solid state") devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors.

    Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.

17. Always connect a test instrument's ground lead to the instrument chassis ground before connecting the positive lead; always remove the instrument's ground lead last.

18. When checking the continuity of the switches or transformer, always make sure that the power is OFF, and one of the lead wires is disconnected.

19. Components that are critical for safety are indicated in the circuit diagram or parts list by shading, ⚠ or ⚠ .

20. Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Special High Voltage Precautions

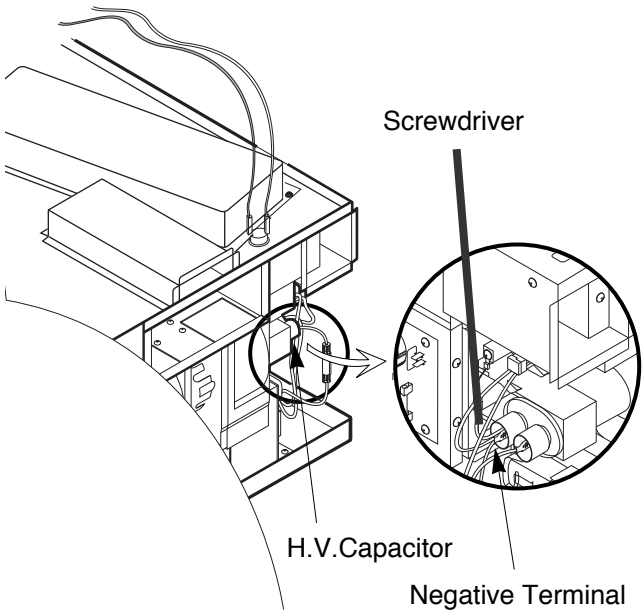
1. High Voltage Warning
   Do not attempt to measureany of the high voltages--this includes the filament voltage of the magnetron. High voltage is present during any cook cycle.

   Before touching any components or wiring, always unplug the oven and discharge the high voltage capacitor (See Figure here)

2. The high-voltage capacitor remains charged about 30 seconds after disconnection. Short the negative terminal of the high-voltage capacitor to the oven chassis. (Use a screwdriver.)

3. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.

Discharge the 2 High Voltage Capacitors before servicing !



Note :Touch chassis side first then short to the high voltage capacitor terminal by using a screwdriver.

PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

PRECAUTION

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

PRECAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

2. Specifications

2-1 Table of Specifications (CM1019)

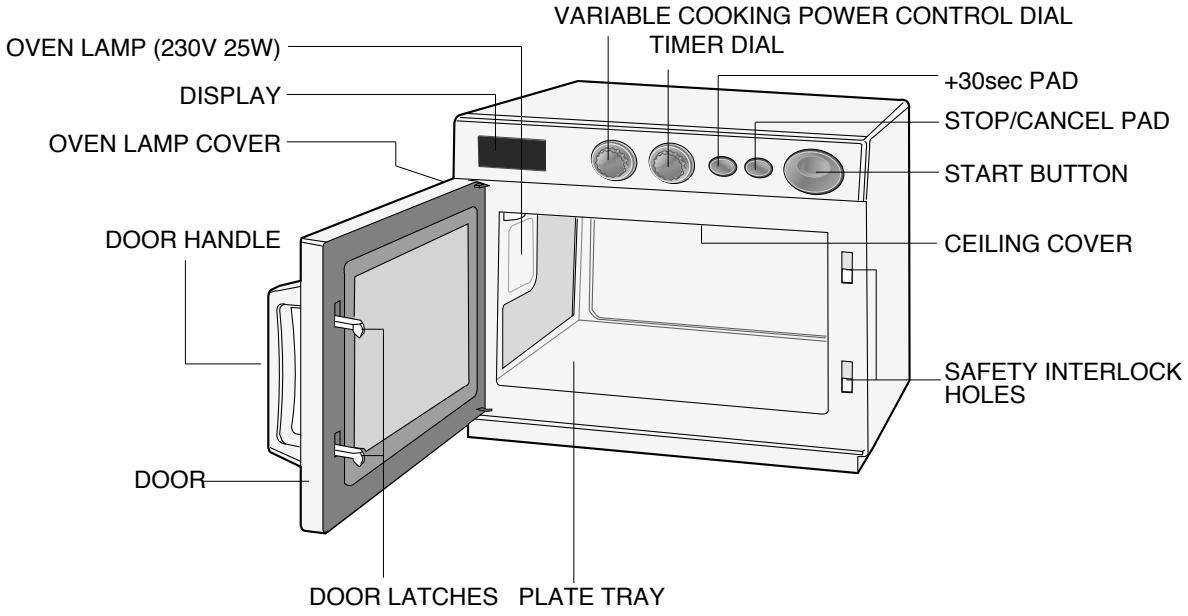
ITEM / MODEL	CM1019
TIMER	Max. 25 min
POWER SOURCE	230V/50HZ, AC
POWER CONSUMPTION	MICROWAVE : 1,700W
OUTPUT POWER	1,000W (IEC-705)
OPERATING FREQUENCY	2,450MHz
MAGNETRON	OM75P(20)ESS
COOLING METHOD	FAN MOTOR
OUTSIDE DIMENSIONS	464(W) x 368(H) x 557(D)
NET WEIGHT	25 Kg
SHIPPING WEIGHT	28 Kg

2-2 Table of Specifications (CM1029)

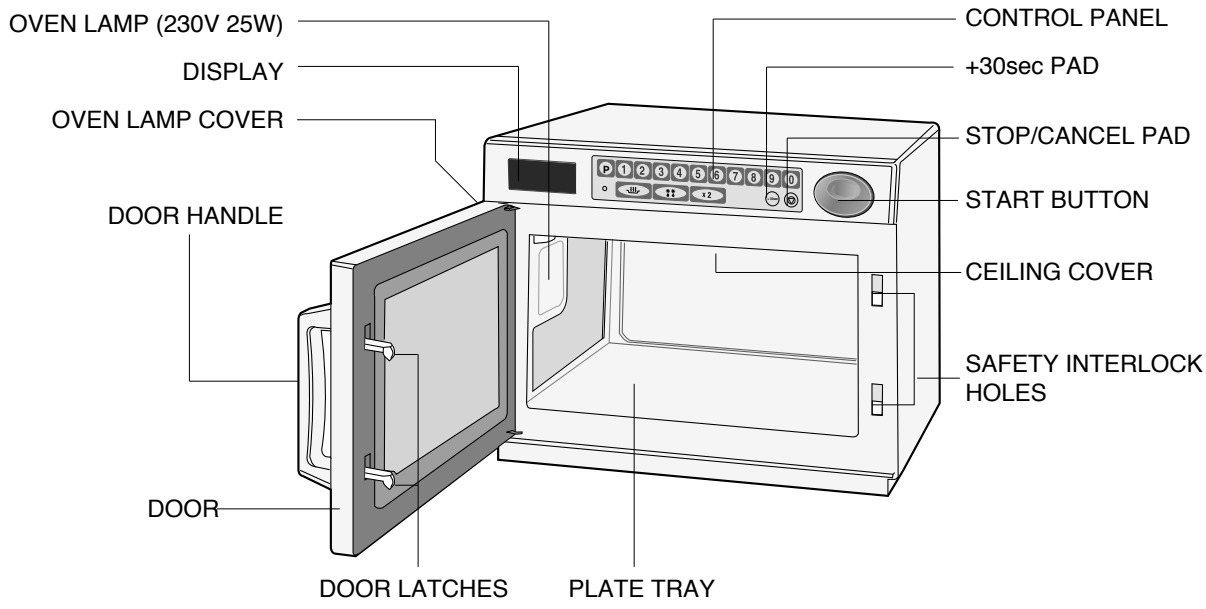
ITEM / MODEL	CM1029
TIMER	Max. 25 min
POWER SOURCE	230V/50HZ, AC
POWER CONSUMPTION	MICROWAVE : 1,700W
OUTPUT POWER	1,000W (IEC-705)
OPERATING FREQUENCY	2,450MHz
MAGNETRON	OM75P(20)ESS
COOLING METHOD	FAN MOTOR
OUTSIDE DIMENSIONS	464(W) x 368(H) x 557(D)
NET WEIGHT	25 Kg
SHIPPING WEIGHT	28 Kg

3. Operating Instructions

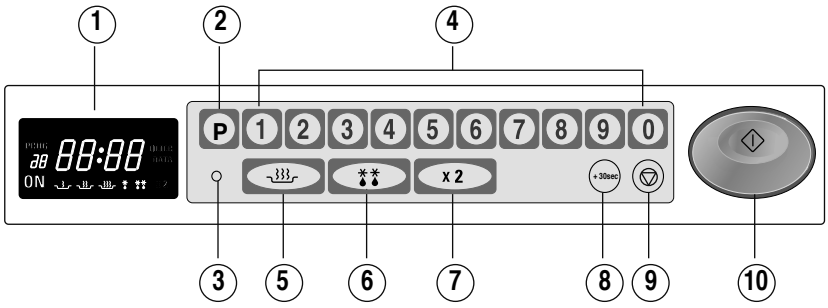
3-1 Features (CM1019)



3-2 Features (CM1029)



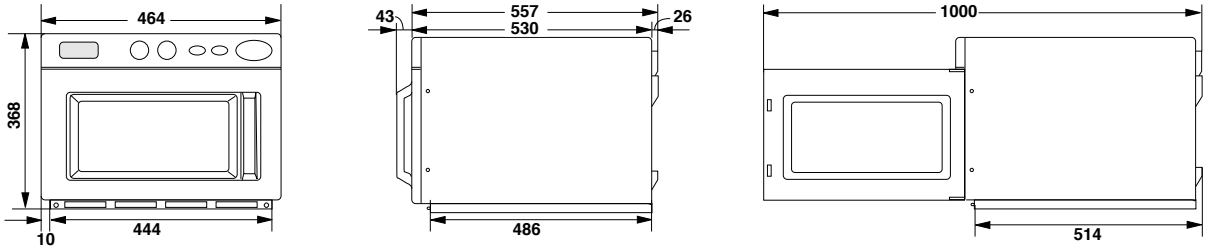
3-3 Control Panel (CM1029)



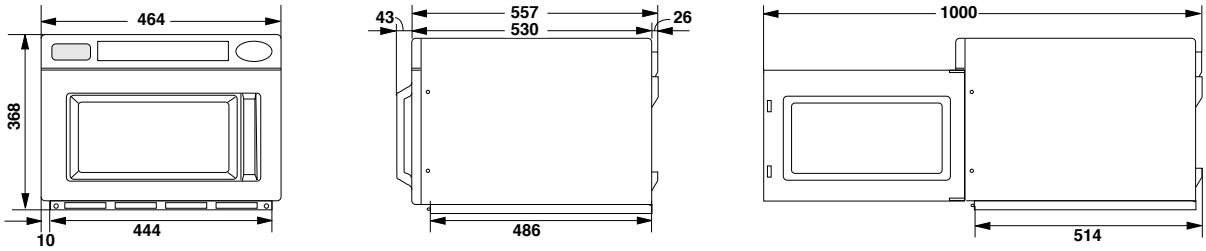
1. DISPLAY
2. PROGRAM PAD
3. PROGRAM LOCK PAD
4. NUMBER PADS(TIME, MEMORY PROGRAMMING)
5. POWER LEVEL SELECTOR PAD
6. DEFROST SELECTOR PAD
7. DOUBLE QUANTITY PAD
8. +30sec PAD (ONE TOUCH COOK PAD)
9. STOP/CANCEL PAD
10. START BUTTON

3-4 External Views

3-4-1 External Views (CM1019)



3-4-2 External Views (CM1029)



3-5 Operation Guide (CM1019)

Cooking/Reheating

1. Make sure the oven is plugged into a properly earthed electrical outlet and 'ON' appears in the display window.

2. Open the door.
   The oven lamp will be turned on.

3. Put the food into a suitable container, place it in the center of the oven and then close the door securely.
   Result: The oven lamp will go off.

4. Select the desired power level by rotating the COOKING POWER CONTROL DIAL.
   Result: The selected power level will be displayed in the display window.

5. Set the desired heating time by rotating the TIMER DIAL.
   Result: "ON" blinks and the selected time is displayed in the display window.

6. Press ◇ pad:
   Result:The oven lamp and cooling fan will be turned on.
   Heating will start.
   The time on digital display will count down.

7. When all time is elapsed, the end of cycle Beep Tone will sound 4 times and all heating will stop. The oven lamp will go off. For 1 min, the display shows *0* and the cooling fan will keep working in order to cool down the interior parts. During the time, the fan will not stop even when you open the door. 1 min later it will stop and ON appears again. Food may be removed from oven whilst the fan is still running.

8. Open the door and take the food out.

9. Close the door. The oven lamp will go off.

NOTE: Whilst heating, one press on ▽ pad stops the oven. You can restart it by pressing the ◇ pad or a second press on ▽ pad will cancel the selected program. When it is NOT in a heating cycle, one tap on ▽ pad cancels the selected program. You can set the power level first and then the cooking time next, or vice versa. You can press +30sec button one or more times in order to add the cooking time by 30 seconds.

3-5 Operation Guide (CM1019 continued)

To stop the cooking

You can stop cooking at any time so that you can:
- Check the food
- Turn the food over or stir it
- Leave it to stand

* Temporarily ; Open the door or press ▽ button once.
  Result: Cooking stops. To resume cooking, close the door and press ◇ again.

* Completely ; Press the ▽ button twice.
  Result: The cooking settings are cancelled.

If you want to cancel any cooking settings before starting cooking, simply press ▽ once.

Using the Defrost Feature

The Defrost feature enables you to defrost meat, poultry, fish.

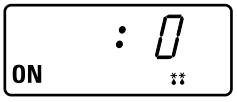
NOTE: Only use containers that are microwave-safe.

1. Open the door.

2. Place the frozen food in the centre of the plate tray.

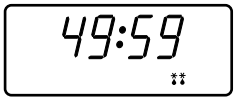
3. Close the door.

4. Rotate the Variable Cooking Power Control dial to the DEFROST HIGH(⁑) or DEFROST LOW(⁎) as you wish.
   Result: The DEFROST indicator appears on the digital display.



5. Rotate the TIMER dial to set the defrosting time.
   The Maximum time that can be set under defrosting mode is 50min.

6. Press ◇ button.
   Result: Defrosting begins.



3-5 Operation Guide (CM1029)

Cooking/Reheating

NOTE: When you first plug in the power cord, the oven beeps once and all the indicators show for 5 sec in the display window.
NOTE: When heating cycle is completed and you open the door, the oven lamp automatically turns on and goes off 1 min later.
NOTE: When you open the door whilst in a heating cycle, the oven stops operating and the oven lamp automatically turns on for 1 min and goes off 1 min later. If you leave the oven door open for more than 1 min, the oven beeps once every minute and after 5 min the power source check indicator 'ON' appears in the display window.

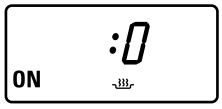
This oven is preset at the factory for automatic operation.

1. Make sure the oven is plugged into a properly earthed electrical outlet and 'ON' appears in the display window.

2. Open the door.
   The oven lamp will be turned on.

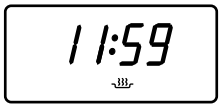
3. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   Result: The oven lamp will go off.

4. Select the desired power level by pressing the Power Level Selector pad.
   Result: The selected power level will be displayed in the display window.



5. Set the desired heating time by pressing the Number pads.
   Result: The selected time is displayed in the display window.

6. Press START button:
   Result: The oven lamp and cooling fan will be turned on. Heating will start. The time on digital display will count down.



7. When all time is elapsed, the end of cycle Beep Tone will sound 4 times and all heating will stop. The oven lamp will go off. For 1 min, the display shows *0* and the cooling fan will keep working in order to cool down the interior parts. During the time, the fan will not stop even when you open the door. 1 min later it will stop and 'ON' appears again. Food may be removed from oven whilst the fan is still running.

8. Open the door and take the food out.

9. Close the door. The oven lamp will go off.

3-5 Operation Guide (CM1029 continued)

Using the Defrost Feature

NOTE: When the oven was operating for longer than 25 min under Defrosting cycle, you can NOT change the power level from Defrosting to Heating(Cooking/Reheating) mode.

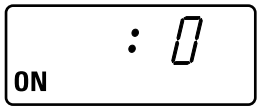
* Use only containers that are microwave-safe.

1. Open the door.

2. Place the frozen food in the centre of the plate tray.

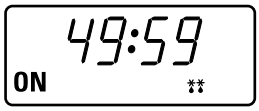
3. Close the door.

4. Press the Defrost selector pad to set DEFROST HIGH (⁑) or DEFROST LOW (⁎) as you wish.
   Result: The selected DEFROST indicator appears in the display.



5. Press the Number pads to set the defrosting time. (Max. 50 min)

6. Press ⏀ button.
   Result: Defrosting begins.



NOTE: It is not possible to set a defrosting time for longer than 50min. The defrost indicator will flash and it is advisable to press CANCEL and enter a new defrost level and time.

Repeat Feature

You can repeat the previous cooking setting (regardless of manual or automatic memory heating) by pressing the START button. The oven starts with exactly the same heating time and power level that were used in the last operation.
NOTE: The repeat feature will be cancelled once the power source is cut off.

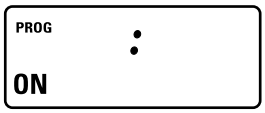
Using +30sec Pad

This is a ONE TOUCH COOK pad.
By touching the +30sec pad once, you can start heating instantly.
You can increase the cooking time by pressing the +30sec pad while heating is being done.
A cooking time increases by 30 seconds at each press on +30sec pad. But it can not exceed the maximum time. Like traditional cooking, you may find that, depending on the food's characteristics or your tastes, you have to adjust the cooking times slightly.
Before operating the oven, times can be increased/decreased using either the time pads or +30sec button. During the operating, time may only be added by using the +30sec button.

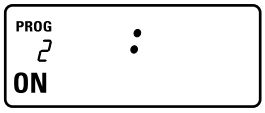
3-5 Operation Guide (CM1029 continued)

Memory Pads Programming

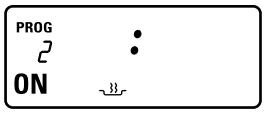
1. Hold down PROGRAM LOCK pad and then press PROGRAM pad. Hold together for 2 sec.
   Be sure to press the pads firmly.
   Result: PROG indicator appears in the digital display.



2. Press appropriate NUMBER pad for the desired memory number.
   Result: Selected memory program code appears below the PROGRAM indicator.

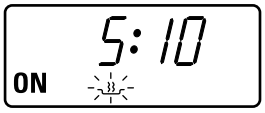


3. Select power level by pressing the POWER LEVEL pad.
   Result:Default power level HIGH appears in the display at first press of the POWER LEVEL pad.
   Press the POWER LEVEL pad one or more times until you get the desired power level.



4. Press NUMBER pads to set the cooking time.
   Result: The maximum time according to each cooking power level can be referred to in the title “Power Levels and Time Variations” on page 8. The NUMBER pads will not operate or respond when you press a cooking time exceeding the maximum value.

NOTE: It is not possible to set a cooking time for longer than the maximum time allowed on the chosen program. The power level indicator will flash and it is advisable to press CANCEL and to enter a new power level and cooking time.



5. Hold down PROGRAM LOCK pad and then press PROGRAM pad. Hold together for 2 sec once again.
   Result: PROG indicator and memory number indicator blink 3 times in the digital display with a beep sound. And then the display goes blank.
   Caution: Be sure to press the pads firmly in the right position.

6. When you want to program more, repeat the procedures above again.
   Memory programs are available up to 20 items. Make sure the unit is properly programmed.
   After programming is finished, all you have to do for memory cooking is to press the NUMBER pad. Then the selected memory program automatically starts cooking.

3-5 Operation Guide (CM1029 continued)

How to Operate Memory Cooking

After having finished memory programming, just press the NUMBER pad of the memory number you want to select. The oven will automatically start heating according to the pre-programmed cooking time and power level after a short delay (5 sec).

1. Make sure the oven is plugged into a properly earthed electrical outlet and 'ON' appears in the display window.

2. Open the door.
   The oven lamp will be turned on.

3. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   Result: The oven lamp will go off.

4. Press NUMBER pad.
   Result: After 2 seconds, the selected memory program automatically starts heating.

Stopping the Cooking

You can stop cooking at any time so that you can:
- Check the food
- Turn the food over or stir it
- Leave it to stand

To stop the cooking;

* Temporarily: Open the door or press ▽ pad once.
  Result: Cooking stops. To resume cooking, close the door and press ◇ again.

* Completely: Press the ▽ pad twice.
  Result: The cooking settings are cancelled.

If you want to cancel any cooking settings before starting cooking, simply press CANCEL pad once.

3-5 Operation Guide (CM1019 / CM1029)

Power Levels and Time Variations

The power level function enables you to adapt the amount of energy dissipated and thus the time required to cook or reheat your food, according to its type and quantity. You can choose between the power levels below.

Power Level	Percentage	CM1019/1029
HIGH( )	100%	1000 W
MEDIUM( )	70%	700 W
LOW( )	50%	500 W
HIGH DEFROST( )	30%	300 W
LOW DEFROST( )	18%	180 W

You cannot set the cooking time longer than maximum value allowed to each specific power level. (see below.)

Power Level	Max. Time
HIGH	25 min.
MEDIUM	40 min.
LOW	40 min.
HIGH DEFROST	50 min.
LOW DEFROST	50 min.

4. Disassembly and Reassembly

4-1 Replacement of Magnetron

Remove the magnetron including the shield case, permanent magnet, choke coils and capacitor (all of which are contained in one assembly).

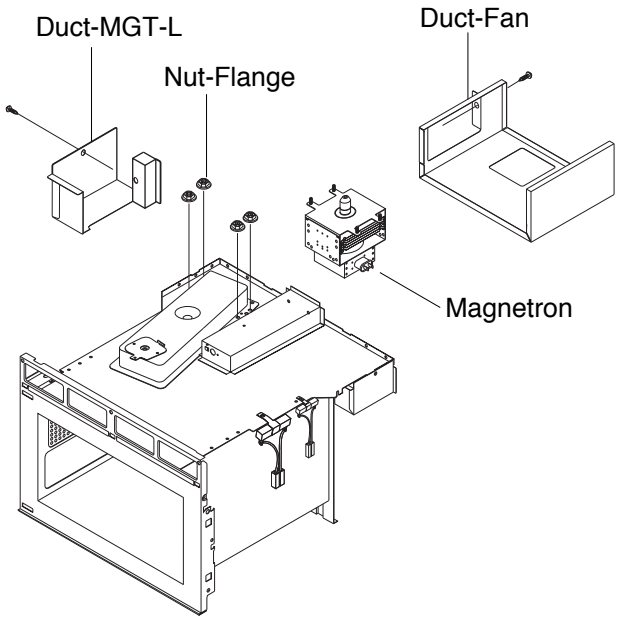
1. Remove the outer panel.

NOTE: Before servicing, make sure to discharge electric charge remaining on the high voltage capacitors or wait for more than 5 min.

2. Remove the back cover.
3. Disconnect all lead wires from the magnetron.
4. Remove screws securing the duct-MGT and duct-fan.
5. Remove the nut-flanges securing the magnetron by using a box wrench.
6. Take out the magnetron very carefully.

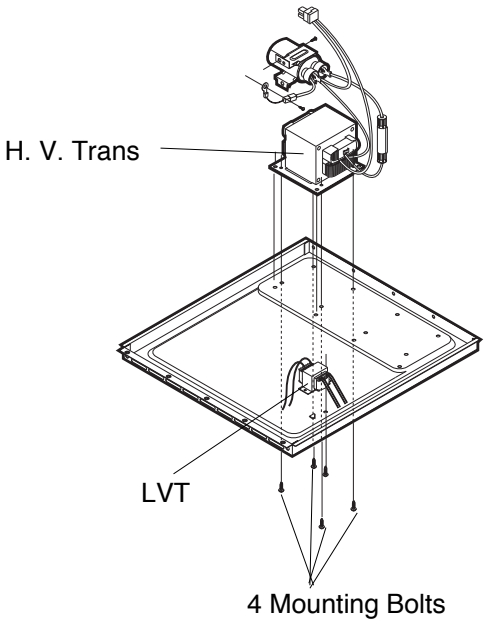
NOTE1: When removing the magnetron, make sure that its antenna does not hit any adjacent parts, or it may be damaged.

NOTE2: When replacing the magnetron, be sure to remount the magnetron gasket in the correct position and make sure the gasket is in good condition. (See page 19 for adjustment instructions.)



4-2 Replacement of High Voltage Transformer

1. Discharge the high voltage capacitor.
2. Disconnect all the leads.
3. Remove the mounting bolts securing the HVT.
4. Reconnect the leads correctly and firmly.



4-3 Replacement of Door Assembly

4-3-1 Removal of Door Assembly

NOTE: Be sure to wear gloves when you disassemble or assemble the parts.

1. Remove hex bolts securing the upper hinge and lower hinge. Then remove the door assembly.
2. Insert the flat screwdriver or thin metal plate into the gap between the door E and door C to remove Door C from the door assembly.
3. Remove 2 screws securing the Door Handle.
4. Unbend the 6 metal tabs around the trim of Decoration Door Cover.
5. Remove 3 screws securing the Door E Ass'y.
6. Remove upper hinge and lower hinge.
7. Remove Decoration Door, Screen B, Key-Door, Spring-Key, Pin-Key as needed.

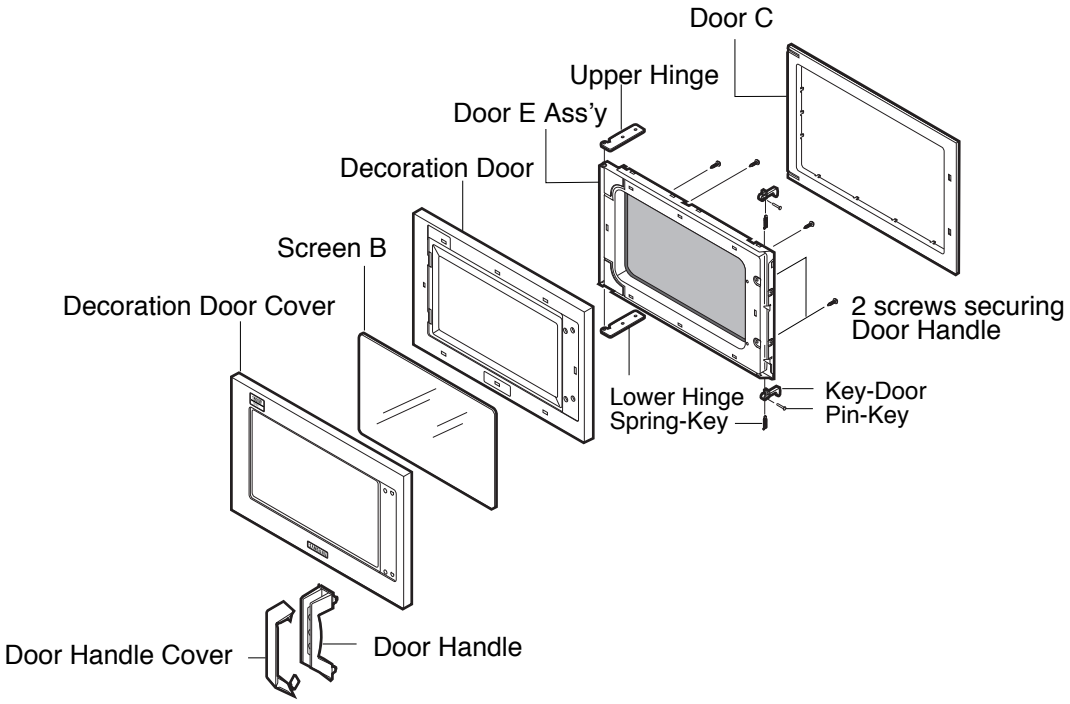
4-3-2 Removal of Door Handle

1. Remove hex bolts securing the upper hinge and lower hinge. Then remove the door assembly.
2. Insert the flat screwdriver or thin metal plate into the gap between the door E and door C to remove Door C from the door assembly.

NOTE: Be careful when handling Door C as is fragile.

NOTE: The thickness of the flat screwdriver or thin metal plate inserted into the gap should be 0.5mm or less.

3. Remove 2 screws securing the Door Handle to the Door E Ass'y.
4. Unbend the 2 metal tabs at both ends of the Door Handle to remove the Door Handle Cover from the Door Handle.



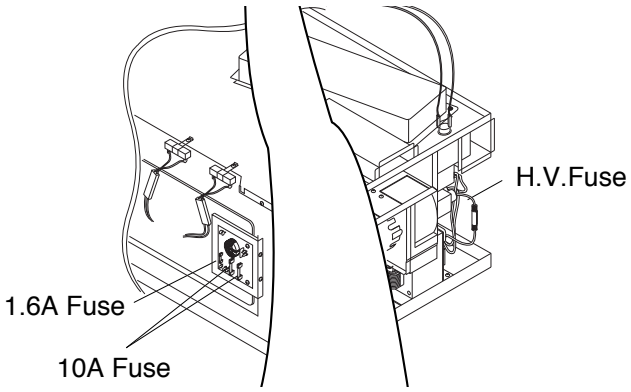
4-3-3 Reassembly Test

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave energy may leak from the space between the door and oven.
3. Do the microwave leakage test.

4-4 Replacement of Fuse and H.V.Fuse

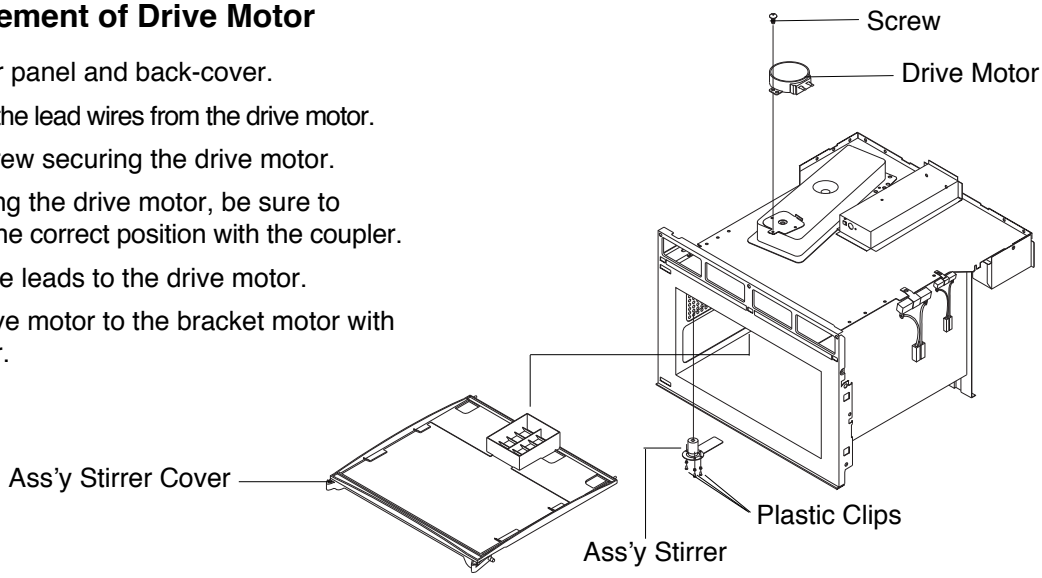
1. Disconnect the oven from the power source.
2. Remove defective fuse from Noise filter.
3. When replacing the fuse, be sure to use an exact replacement part. If new fuse blows out again after replacement, check the primary interlock switch, door sensing switch and interlock monitor switch.
4. When the above three switches operate properly, check if any other part such as the control circuit board, fan motor or high voltage transformer is defective.



4-5 Replacement of Drive Motor & Ass'y Stirrer

4-5-1 Replacement of Drive Motor

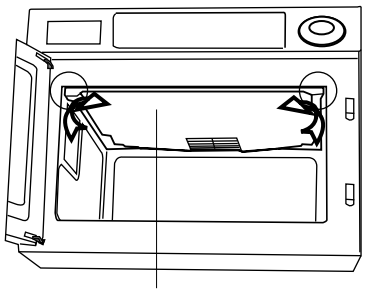
1. Remove outer panel and back-cover.
2. Disconnect all the lead wires from the drive motor.
3. Remove a screw securing the drive motor.
4. When replacing the drive motor, be sure to remount it in the correct position with the coupler.
5. Connect all the leads to the drive motor.
6. Screw the drive motor to the bracket motor with a screw driver.



4-5-2 Replacement of Ass'y Stirrer

1. Remove a screw securing the drive motor.
2. Open the door.
3. Hold side stoppers of ceiling cover (Ass'y Stirrer Cover) with both hands and pull them in and down.
4. Take the ceiling cover out of the oven cavity.
5. Remove plastic clips securing the Ass'y Stirrer.

Caution: When removing the Ass'y Stirrer Cover, be sure to be extremely careful about the exposed inside components on the top of the oven cavity. If any of them are deformed, abnormal symptom can happen such as arcing or sparks during operation.



To remove Ass'y Stirrer Cover: Hold side stoppers of ceiling cover with both hands and pull them in and down.

4-6 Replacement of Control Box Ass'y and P.C.Board

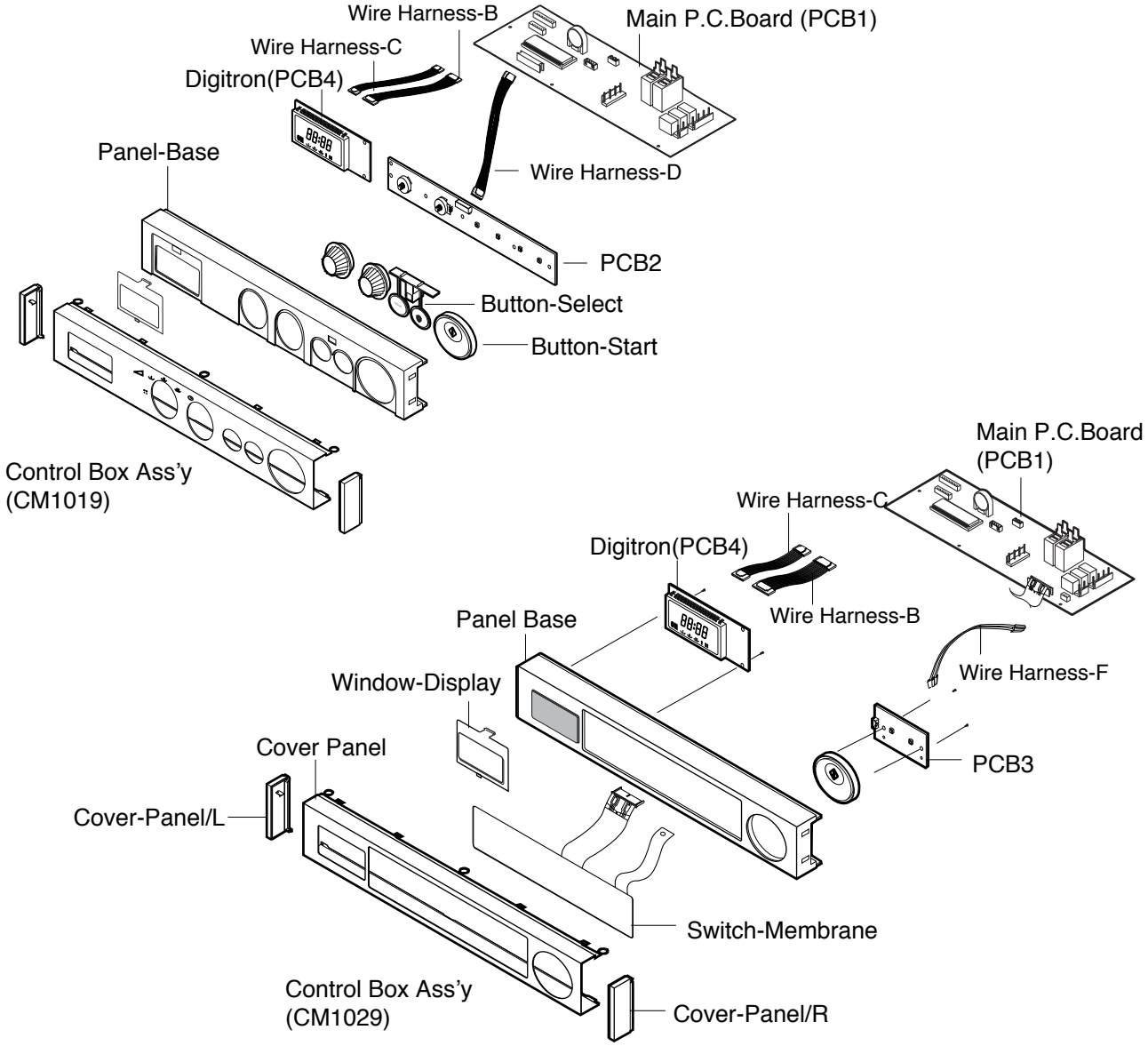
4-6-1 Removal of Control Box Assembly

1. Be sure to discharge any static electric charge built up on your body and avoid touching the touch control circuitry.
2. Remove 3 screws securing the Control Box Ass'y to the oven cavity.
3. Disconnect all the lead wires, connectors and ground taping (CM1029) from the main control circuit board (PCB1).
4. Lift up the FPC connector hooks about 5mm upward which connects to the main control circuit board (PCB1) from the tail of switch membrane of the control box assembly. (CM1029)
5. Remove a screw securing the tapped taping to PCB1. (CM1029)
6. Remove Control Box Ass'y.
7. To replace Digitron, remove 2 screws securing the PCB4.
8. To replace Start Button Circuitry, remove 3 screws securing the PCB3. (CM1029)
9. Unbend the metal tabs holding the Panel-Base to Control Box body.

4-6-2 Removal of main P.C.Board

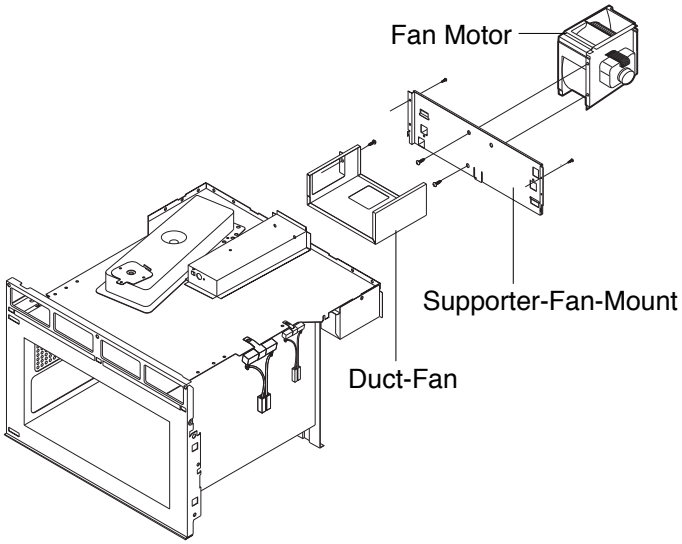
1. Remove Control Box Assembly by following the steps 1~ 5 at left.
2. Remove 4 screws securing the main PCBoard to the bracket PCBoard.

NOTE: When handling the the touch control circuitry, be most careful to avoid damage.



4-7 Replacement of Fan Motor

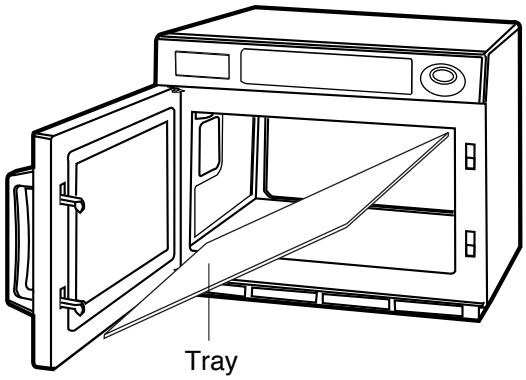
1. Remove the outer panel and back-cover.
2. Discharge the high voltage capacitor.
3. Remove all the lead wires from Magnetron and High Voltage Capacitor.
4. Remove 2 screws securing the duct fan.
5. Remove 2 screws securing the Supporter-Fan-Mount.
6. Lift the Fan Motor Ass'y slightly left and pull it out.
7. Remove lead wires and connectors.
8. Turn the fan motor ass'y over so that the bracket side is up.
9. Remove 2 screws securing the Fan Motor.



4-8 Replacement of Tray

1. Open the door.
2. Remove the tray by inserting a thin metal tool into the gap between the oven wall and the tray silicon cover.
3. Insert the new tray by tilting it across the oven cavity.
4. Firstly fix the front part (refers to the place where the silicon cover is thinner than the other 3 edges) and then place the backward part carefully and firmly.

NOTE: Be careful when you handle the tray since it is fragile.

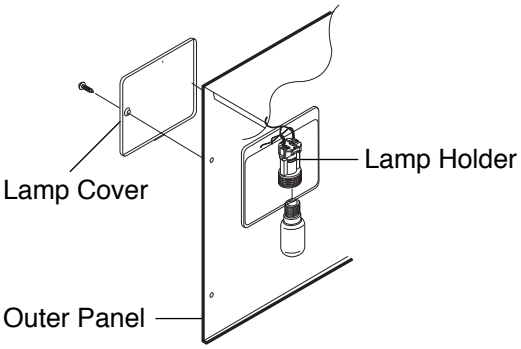


4-9 Replacement of Lamp

NOTE: You don't need to remove the outer panel or other parts in order to replace a lamp.

1. Remove a screw securing the lamp cover.
2. Remove the lamp by rotating it clockwise.
3. Replace with a new lamp by rotating it counter-clockwise.

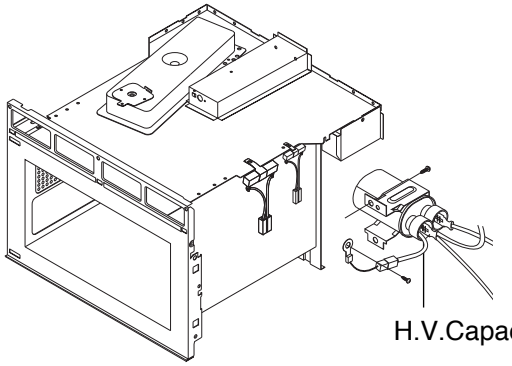
NOTE : If it is necessary to replace the lamp holder, you can disconnect lead wires by pushing down on the hole of lead wires using a long pointed tool.



4-10 Replacement of High Voltage Capacitor

NOTE: It is not necessary to remove Magnetron in order to remove HVC.

1. Remove the outer panel and back cover.
2. Discharge the high voltage capacitor.
3. Remove HVT wire and H.V.Fuse.
4. Remove screws securing HVC bracket.



5. Alignment and Adjustments

PRECAUTION

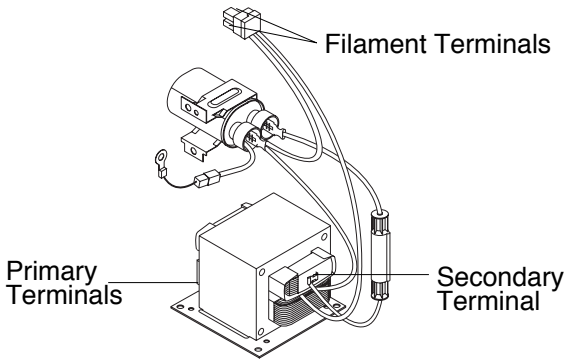
1. High voltage is present at the high voltage terminals during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

5-1 High Voltage Transformer

1. Remove connectors from the transformer terminals and check continuity.
2. Normal resistance readings are as follows:

Terminal	Resistance
Secondary	Approx. 75 Ω
Filament	Approx. 0Ω
Primary	Approx. 1.2 Ω

(Room temperature = 20˚C)



5-2 Low Voltage Transformer

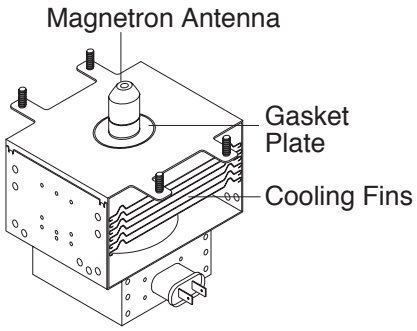
1. The low voltage transformer is located on the base plate.
2. Remove the low voltage transformer from the base plate and check continuity.
3. Normal resistor reading is shown in the table.

Terminals	Resistance	Wire
1~2(input)	Approx. 296Ω	WHT
3~4(output 20V)	Approx. 5.1Ω	RED
5~6(output 3.2V)	Approx. 1.1Ω	YEL

5-3 Magnetron

Continuity checks can indicate only an open filament or a short magnetron. To diagnose an open filament or short magnetron :

1. Isolate the magnetron from the circuit by disconnecting its leads.
2. A continuity check across the magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



5-4 High Voltage Capacitor

1. Check continuity of the capacitor with the meter set at the highest resistance scale.
2. Once the capacitor is charged, a normal capacitor shows continuity for a short time, and then indicates 9MΩ.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9MΩ.
5. Resistance between each terminal and chassis should read infinite.

5-5 High Voltage Diode

1. Isolate the diode from the circuit by disconnecting its leads.
2. With the ohm-meter set at the highest resistance scale, measure across the diode terminals. Reverse the meter leads and read the resistance. A meter with 6V, 9V or higher voltage batteries should be used to check the front-to back resistance of the diode (otherwise an infinite resistance may be read in both directions). The resistance of a normal diode will be infinite in one direction and several hundred KΩ in the other direction.

5-6 Main Relay and Power Control Relay

1. The relays are located on the PCB Ass'y. Isolate them from the main circuit by disconnecting the leads.
2. Operate the microwave oven with a water load in the oven. Set the power level to high.
3. Check continuity between terminals of the relays after Start pad is pressed.

5-7 Adjustment of Primary, Door Sensing and Monitor Switch

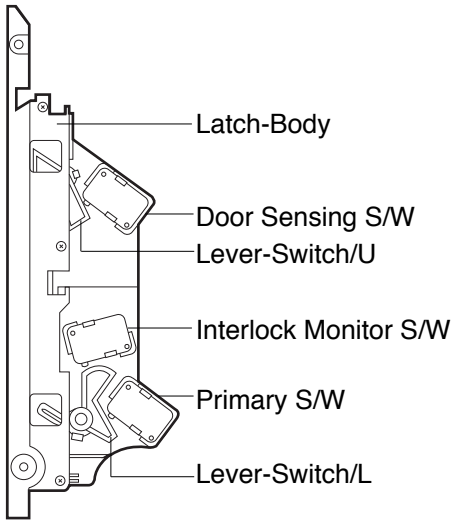
Precaution

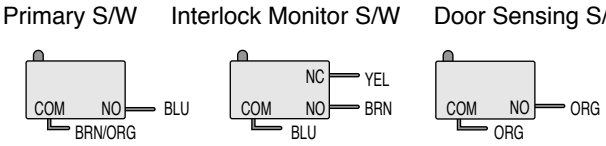
For continued protection against radiation hazard, replace parts in accordance with the wiring diagram and be sure to use the correct part number for the following switches: Primary and door sensing switches, and the interlock monitor switch (replace all together). Then follow the adjustment procedures below. After repair and adjustment, be sure to check the continuity of all interlock switches and the interlock monitor switch.

1. When mounting Primary switch and Interlock Monitor switch to Latch Body, consult the figure.

   NOTE:No specific adjustment during installation of Primary switch and Monitor switch to the latch body is necessary.

2. When mounting the Latch Body to the oven assembly, adjust the Latch Body by moving it so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the Latch Body to the oven assembly.
3. Reconnect to Monitor switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.
4. Confirm that the gap between the switch housing and the switch actuator is no more than 0.5mm when door is closed.





	Door Open	Door Closed
Primary S/W	∞	0
Monitor S/W(COM-NC)	0	∞
Monitor S/W(COM-NO)	∞	0
Door Sensing S/W	∞	0

5-8 Output Power of Magnetron

CAUTION
MICROWAVE RADIATION

PERSONNEL SHOULD NOT ALLOW EXPOSURE TO MICROWAVE RADIATION FROM MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

The output power of the magnetron can be measured by performing a water temperature rise test.
Equipment needed :
* Two 1-liter cylindrical borosilicate glass vessel (Outside diameter 190 mm)
* One glass thermometer with mercury column

NOTE: Check line voltage under load. Low voltage will lower the magnetron output. Make all temperature and time tests with accurate equipment.

1. Fill the one liter glass vessel with water.
2. Stir water in glass vessel with thermometer, and record glass vessel's temperature ("T1", 10±1˚C).
3. After moving the water into another glass vessel, place it in the center of the cooking tray. Set the oven to high power and operate for 45 seconds. (3 seconds included as a holding time of magnetron oscillation)
4. When heating is finished, stir the water again with the thermometer and measure the temperature ("T2").
5. Subtract T1 from T2. This will give you the water temperature rise. (ΔT)
6. The output power is obtained by the following formula;

$$\text{Output Power} = \frac{4.187 \times 1000 \times \Delta T + 0.88 \times MC \times (T_2 - T_0)}{42}$$

45 : Heating Time (sec)
4.187 : Coefficient for Water
1000 : Water (cc)
ΔT : Temperature Rise (T2-T1)
MC : Cylindrical borosilicate glass weight
T_0 : Room temperature

7. Normal temperature rise for this model is 9˚C to 11˚C at 'HIGH'.
   NOTE 1: Variations or errors in the test procedure will cause a variance in the temperature rise. Additional power test should be made if temperature rise is marginal.
   NOTE 2: Output power in watts is computed by multiplying the temperature rise (step 5) by a factor of 90 times of centigrade temperature.

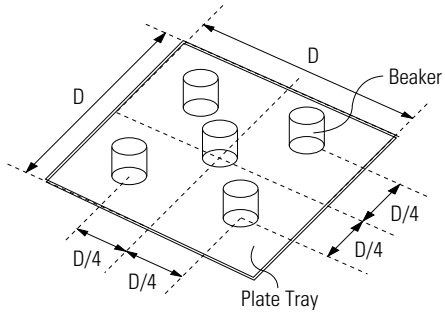
5-9 Microwave Heat Distribution - Heat Evenness

The microwave heat distribution can be checked indirectly by measuring the water temperature rise at certain positions in the oven:

1. Prepare five beakers made of 'Pyrex', having 100 milliliters capacity each.
2. Measure exactly 100milliliters of water load with a measuring cylinder, and pour into each beaker.
3. Measure the temperature of each water load. (Readings shall be taken to the first place of decimals.)
4. Put each beaker in place on the plate tray as illustrated in figure below. Start heating.
5. After heating for 1 minute, measure the water temperature in each beaker.
6. Microwave heat distribution rate can be calculated as follows:

$$\text{Heat Distribution} = \frac{\text{Minimum Temperature Rise}}{\text{Maximum Temperature Rise}} \times 100(\%)$$

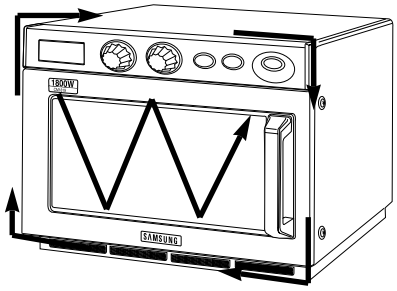
The result should exceed 65%.



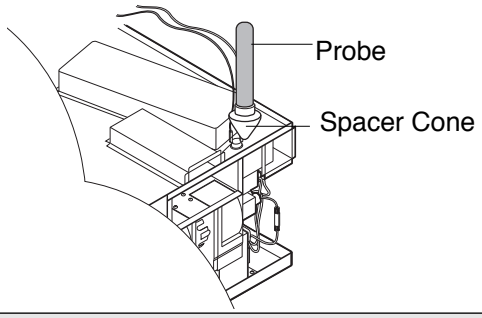
5-10 Check for Microwave Leakage

5-10-1 Procedure for Measurement of Microwave Energy Leakage

1) Pour 275 ±15cc of 20°C±5°C (68°F±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2) Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3) Set survey meter with dual ranges to 2,450MHz.
4) When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam, the door viewing window and the exhaust openings moving the probe in a clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 2 inches to any metal. If it gets closer than 2 inches, erroneous readings may result.
5) Measured leakage must be less than 4mW/cm2, after repair or adjustment.



Maximum leakage allowed is 5mW/cm^2.
4mW/cm^2 is used to allow for measurement and meter accuracy



WARNING
AVOID THE HIGH VOLTAGE COMPONENTS.

5-10-2 Note on Measurement

1) Do not exceed the limited scale.
2) The test probe must be held on the grip of the handle, otherwise a false reading may result when the operator's hand is between the handle and the probe.
3) When high leakage is suspected, do not move the probe horizontally along the oven surface; this may cause damage to the probe.
4) Follow the recommendation of the manufacturer of the microwave energy survey meter.

5-10-3 Record keeping and notification after measurement

1) After adjustment and repair of a radiation preventing device, make a repair record for the measured values, and keep the data.
2) If the radiation leakage is more than 4mW/cm^2 after determining that all parts are in good condition, functioning properly and the identical parts are replaced as listed in this manual, notify that fact to ; CENTRAL SERVICE CENTER
3) At least once a year have the microwave energy survey meter checked for accuracy by its manufacturer.

6. Troubleshooting

PRECAUTION

1. CHECK GROUNDING BEFORE CHECKING FOR TROUBLE.
2. BE CAREFUL OF THE HIGH VOLTAGE CIRCUIT.
3. DISCHARGE THE HIGH VOLTAGE CAPACITOR.
4. WHEN CHECKING THE CONTINUITY OF THE SWITCHES OR TRANSFORMER, DISCONNECT LEAD WIRES FROM THESE PARTS AND THEN CHECK CONTINUITY WITHOUT THE POWER SOURCE ON. TO DO OTHERWISE MAY RESULT IN A FALSE READING OR DAMAGE TO YOUR METER.
5. DO NOT TOUCH ANY PART OF THE CIRCUIT OR THE CONTROL CIRCUIT BOARD, SINCE STATIC DISCHARGE MAY DAMAGE IT. ALWAYS TOUCH GROUND WHILE WORKING ON IT TO DISCHARGE ANY STATIC CHARGE BUILT UP.

6-1 Electrical Malfunction

SYMPTOM	CAUSE	CORRECTIONS
Oven is dead. Fuse is OK. No display and no operation.	1. Open or loose lead wire harness 2. Open thermal cutout (magnetron, cavity) 3. Open low voltage transformer 4. Defective Ass'y PCB	Check magnetron or cavity thermal cutout switch is defective. Check Ass'y PCB when LVT is defective.
No display and no operation Fuse blown out. (10A, 1.6A)	1. Shorted lead wire 2. Defective primary latch switch (NOTE1) 3. Defective monitor switch (NOTE1) 4. Shorted HVCapacitor 5. Shorted HVTransformer (NOTE2)	Check adjustment of primary, interlock monitor, door sensing switch.
	NOTE 1: All of these switches must be replaced at the same time. (refer to adjustment instructions) Check continuity of main or power relay contacts and if it has continuity, replace main or power relay also. NOTE 2: When HVTransformer is replaced, check diode and magnetron also.	
Oven does not accept key input (Program) (CM1029)	1. Key input is not in-Sequence 2. Open or loose connection of membrane key pad to Ass'y PCB 3. Shorted or open membrane panel 4. Defective Ass'y PCB	Refer to operation procedure. Replace PCB main.
Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on.)	1. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to lower output and/or intermittent oscillation. 2. Defective high voltage components H.V.Transformer H.V.Capacitor H.V.Diode, H.V.Fuse Magnetron	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if defective.

6-1 Electrical Malfunction(continued)

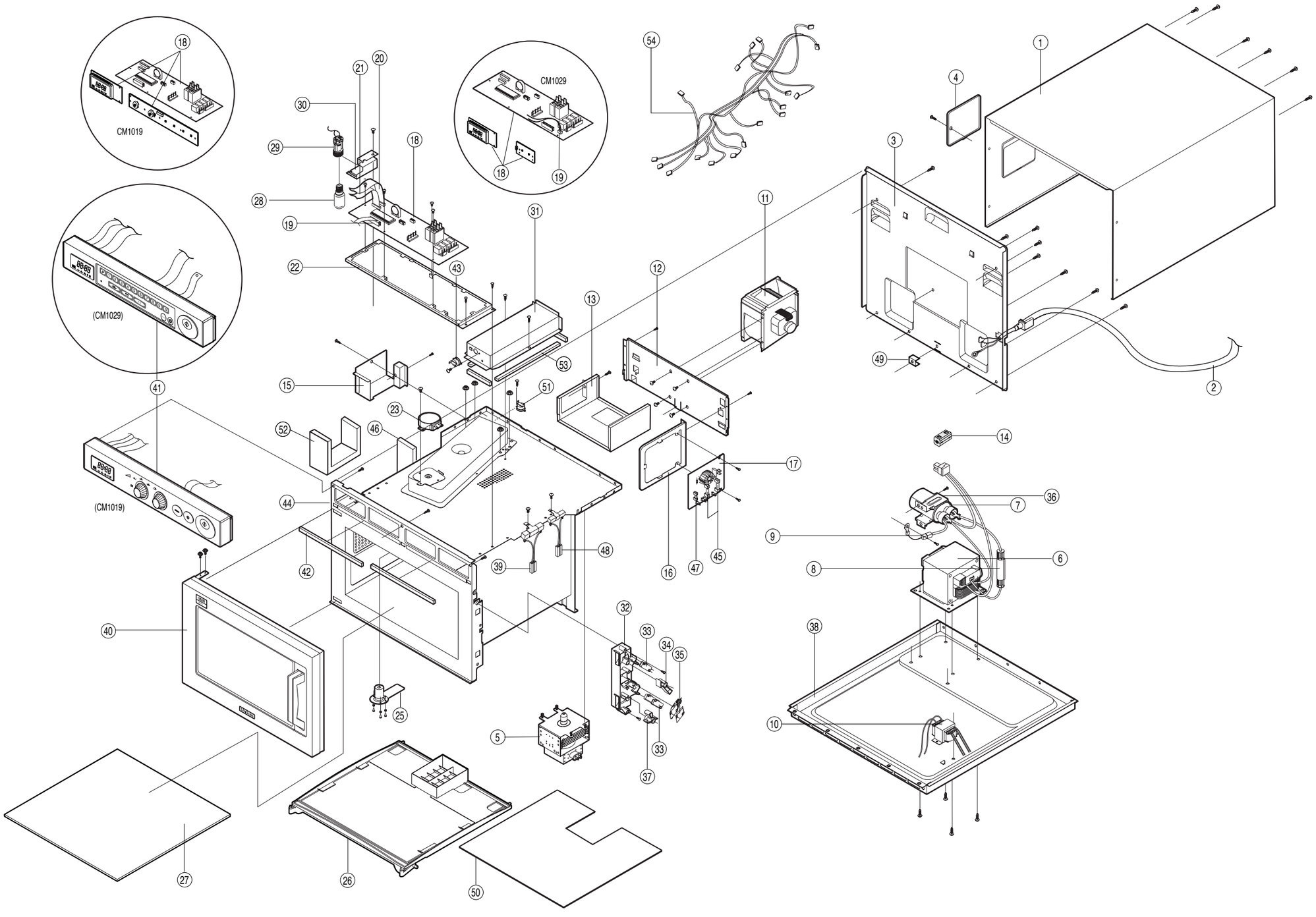
SYMPTOM	CAUSE	CORRECTIONS
Oven lamp goes off	1. Loose lead wire or open lamp filament 2. Misadjustment of latch switch 3. Defective latch switch	Tighten lamp lead wire or replace with a new lamp
Microwave output is low;. Oven takes longer time to cook food. (No heat while oven lamp and ventilation motor.)	1. Decrease in power source voltage. 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging of magnetron 4. Defective high voltage components H.V.Transformer H.V.Capacitor H.V.Diode,H.V.Fuse Magnetron	Consult electrician. Check high voltage component according to component test procedure and replace if defective.
Oven does not operate and return to plugged-in mode.	Defective Ass'y PCB	Replace Ass'y PCB.
Loud buzzing noise can be heard.	1. Loose fan and Fan motor 2. Loose screws on H.V.Transformer 3. Shorted H.V.Diode 4. Loose or missing screws on Cover-Back	Tighten screws of Fan motor. Tighten screws of H.V.Transformer. Replace H.V.Diode. Tighten screws of Cover-Back
Drive motor not work. (Assy stirrer does not rotate.)	1. Open or loose wiring of drive motor. 2. Defective drive motor. 3. Defective ass'y stirrer	Check the wire of drive motor Replace drive motor. Replace ass'y stirrer.
Oven stops operating during cooking.	1. Operation of thermal cutout (Magnetron or Cavity) 2. Fan motor does not rotate.	Adjust door and latch switches. Replace Fan motor.
Sparks	1. Metallic ware or cooking dishes touching on the oven wall. 2. Ceramic ware trimmed with gold or silver powder also causes sparks.	Inform the customer of proper use. Do not use any type of cookware with metallic trimming.
Uneven cooking	Uneven intensity of microwave due to its characteristics.	Wrap thinner parts of the food with aluminum foil. Use plastic wrap or cover with a lid. Stir once or twice while cooking foods such as soup, cocoa, or milk.
Noise from turntable motor when it starts to operate.	Noise may result from the motor.	Replace turntable motor.
Oven can program but timer does not start.	Defective circuitry of Start function of Main PCB Ass'y. Loose lead wires	Check circuitry of Start function of Main PCB Ass'y and replace if defective. Adjust or repair loose wires.

6-2 Error Codes & Corrections

Code	Cause	Corrections
E1	1. Improper input power frequency 2. Defective Ass'y Main PCB	Check if power frequency is 50Hz. Replace Ass'y Main PCB or MICOM.
E5 (CM1029)	1. Memory IC (EEPROM IC) failure 2. MICOM failure	Check Memory IC (IC3) and replace if defective. Replace Assy Main PCB or MICOM.

7. Exploded Views and Parts List

7-1 Exploded Views



7-2 Main Parts List

No.	Parts No.	Parts Name	Description/Specification	Q'ty	Remarks
1	DE70-30123B	PANEL-OUTER	STS430 T0.5 CM-1019	1	
2	DE39-20137A	ASSY POWER CORD	700V 15A HO7RN-F3G 1.5mm	1	
3	DE71-60421A	COVER-BACK	SECC T0.6 W481.8 L363.9 CM-181	1	
4	DE71-60422A	COVER-LAMP	STS430 T0.6 CM-1819	1	
5	DE03-30070A	MAGNETRON	OM75P(20)ESS 1KW 4.4KV COMM	1	⚠
6	DE26-00016A	TRANS H.V	SHV-1830EC 230V 2350V/3.2V	1	⚠
7	2501-001012	C-OIL	1.13uF 2100V BK 35X54X90 20mm	1	
8	DE91-70061A	ASSY-H.V.FUSE	THV060T-0800-H 5KV/0.8A WHT	1	
9	DE59-40001A	DIODE-H.V	HVR-1X-32B-12	1	⚠
10	DE26-20162A	TRANS L.V	SLV-1829E 230 19.7/3.1V 50Hz 4	1	
11	DE31-00003A	MOTOR-FAN	SMF-1029EA “E” 230V 2330RPM	1	
12	DE61-30189A	SUPPORTER-FAN-MOUNT	SECC T1.0 CM-1819	1	
13	DE72-00025A	DUCT-FAN	SECC T0.5 CM-1019	1	
14	DE73-90027A	FERRITE-CORE	NI-ZN T13.8 W21.0 L28	1	
15	DE72-50090A	DUCT-MGT/L	SECC T0.5 CM-1819	1	
16	DE61-50568A	BRACKET-SUPPORT	SECC T0.5	1	
17	DE96-00003B	ASSY NOISE FILTER	SN1830 230V/50Hz	1	
18	DE97-00053A	ASSY PCB-MAIN	CM1029 230V50Hz VFD	1	CM1029 ⚠
18	DE97-00052A	ASSY PCB-MAIN	CM1019 230V50Hz VFD	1	CM1019 ⚠
19	DE39-40695A	WIRE HARNESS-D	230V50Hz CM1819 EUROPE	1	CM1019
19	DE39-40113B	WIRE HARNESS-F	100V 50/60HZ RE-CH1	1	CM1029
20	DE39-40692A	WIRE HARNESS-B	230V50HZ CM1819/29 EUROPE	1	
21	DE39-40694A	WIRE HARNESS-C	230V50Hz CM1819/29 EUROPE	1	
22	DE61-50520A	BRACKET-PCB	SECC T0.8 CM-1819	1	
23	DE31-10164C	MOTOR-DRIVE	M2LJ29A702 220/240V 29.1/34.9RPM	1	
24	DE92-90515A	ASSY-STIRRER	CM1819 CM1829	1	
25	DE69-90054A	CLIP-STIRRER	PFA 5mm CM1819/29	3	
26	DE71-60423A	COVER-STIRRER	PP CM1819	1	
27	DE74-20116A	TRAY-CERAMIC	CERAMIC T3.0 CM1819	1	
28	4713-000168	LAMP-INCANDESCENT	230V 25W ORG	1	
29	DE47-40029A	SOCKET-LAMP	250V2A 22.230 E14 BJB	1	
30	DE61-90318A	HOLDER-LAMP	SECC T0.8 W134 L40.5	1	
31	DE72-50091A	DUCT-OVEN	STS430 T0.4 CM1819	1	
32	DE66-40062A	LATCH-BODY	PP CM1819	1	
33	3405-000178	SWITCH-MICRO	250V 15A 200gf SPST-NO	2	
34	DE66-90107A	LEVER-SWITCH/U	PBT CM1819	1	
35	3405-000175	SWITCH-MICRO	250V 15A 200gf SPST-NO	1	
36	DE61-50120A	BRACKET-HVC	SECC T0.6 W62 L72	1	
37	DE66-90108A	LEVER-SWITCH/L	PBT CM1819	1	
38	DE80-10113B	BASE-PLATE	SGCD1 T1.0	1	
39	DE39-00032A	WIRE LEAD-R CEMENT	47Ω 30W CEMENT	1	
40	DE92-40214J	ASSY DOOR-BADGZ	CM1019 STS430 1000W	1	CM1019 ⚠
40	DE92-40214K	ASSY DOOR-BADGZ	CM1029 STS430 1000W	1	CM1029 ⚠
41	DE93-30528B	ASSY CONTROL-PANEL	CM1019(MZ)	1	CM1019 ⚠
41	DE93-30529B	ASSY CONTROL-PANEL	CM1029(TC)	1	CM1029 ⚠

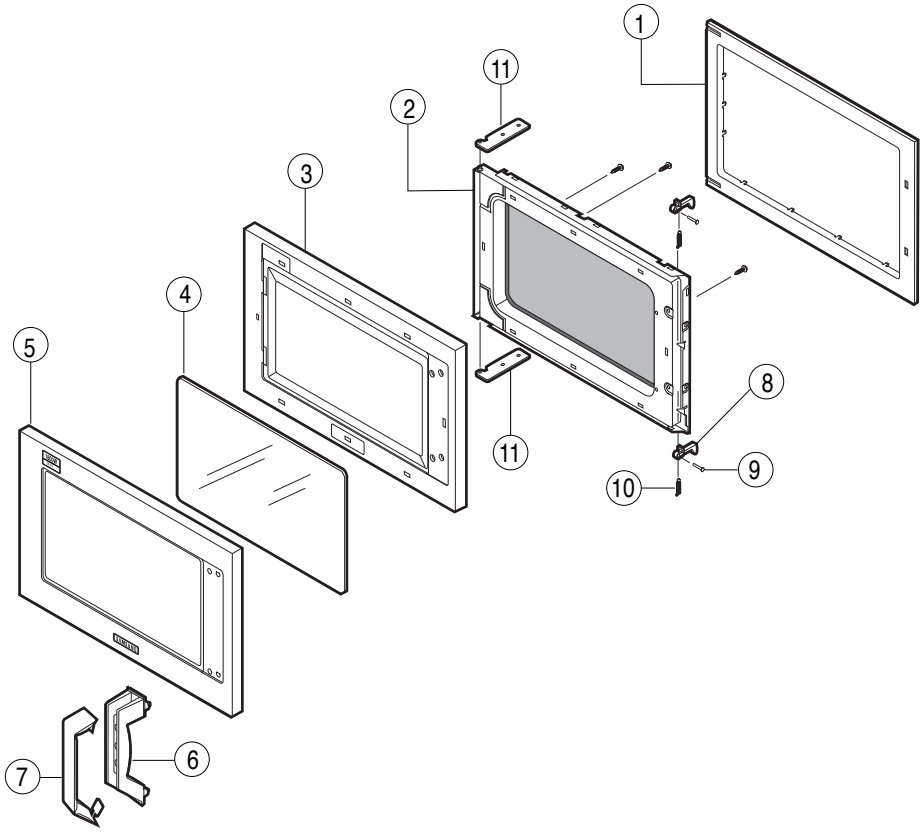
⚠ : Warning ⚠ :Electrostatically Sensitive Devices

7-2 Main Parts List (continued)

No.	Parts No	Parts Name	Description/Specification	Q'ty	Remarks
42	DE63-90191E	CUSHION-GUIDE-E	PUT-FOAM T10 W2 L450 CM1819/29	1	
43	DE47-20197A	THERMOSTAT	NT-101NA(8XV)P 100/60 250V/7.5	1	
44	DE92-10157B	ASSY CAVITY	CM1019	1	* S.N.A.
45	3601-001034	FUSE-FERRULE	PUT-FOAM T10 W50 L530	1	
46	DE63-00001A	CUSHION-LAMP	T35 W20 L230 CM1819	1	
47	3601-001126	FUSE-FERRULE	250V 1.6A QUICK-ACTING CERAMIC	1	
48	DE93-90112A	ASSY-B/RESISTOR	CM1819/29 10W 15Ω	2	
49	DE61-50541A	BRACKET-EARTH	SGCC2 T1.0 W15 L8	1	
50	DE71-60424A	COVER-CEILING	MICA_SHEET T0.5 W348 L319 CM-1	1	
51	DE47-20017A	THERMOSTAT	PW-2N(150/60 187Z) 250V/7.5A 1	1	
52	DE63-90191B	CUSHION-GUIDE-B	PUT-FOAM T10 W50 2530	1	
53	DE63-90191F	CUSHION-GUIDE-F	PUT-FOAM T10 W2 L700 CM1819/29	1	
54	DE39-00051A	WIRE HARNESS-A	230V50HZ CM1019/29	1	

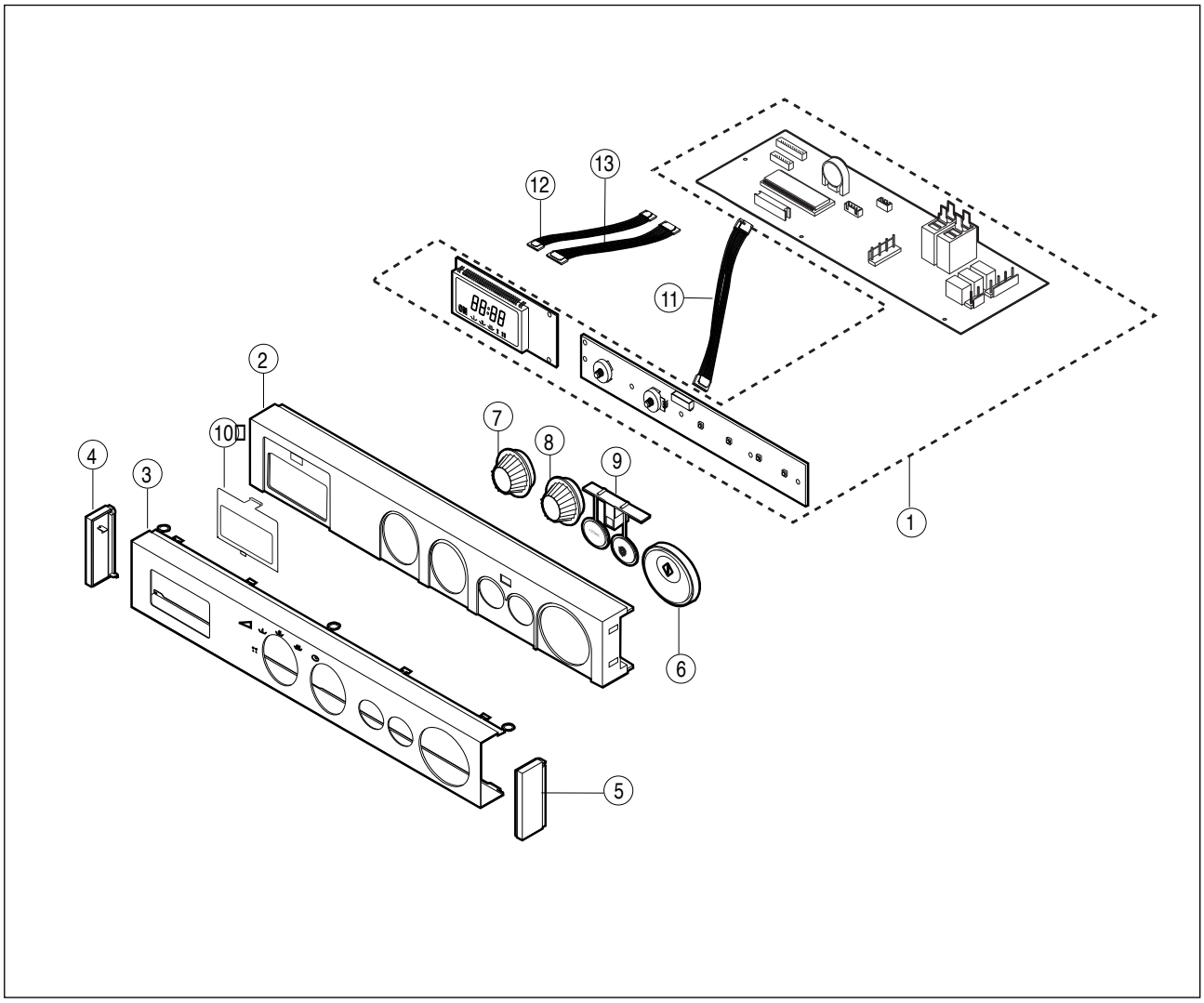
* S.N.A : Service Not Available

7-3 Exploded View & Parts List - Door Parts



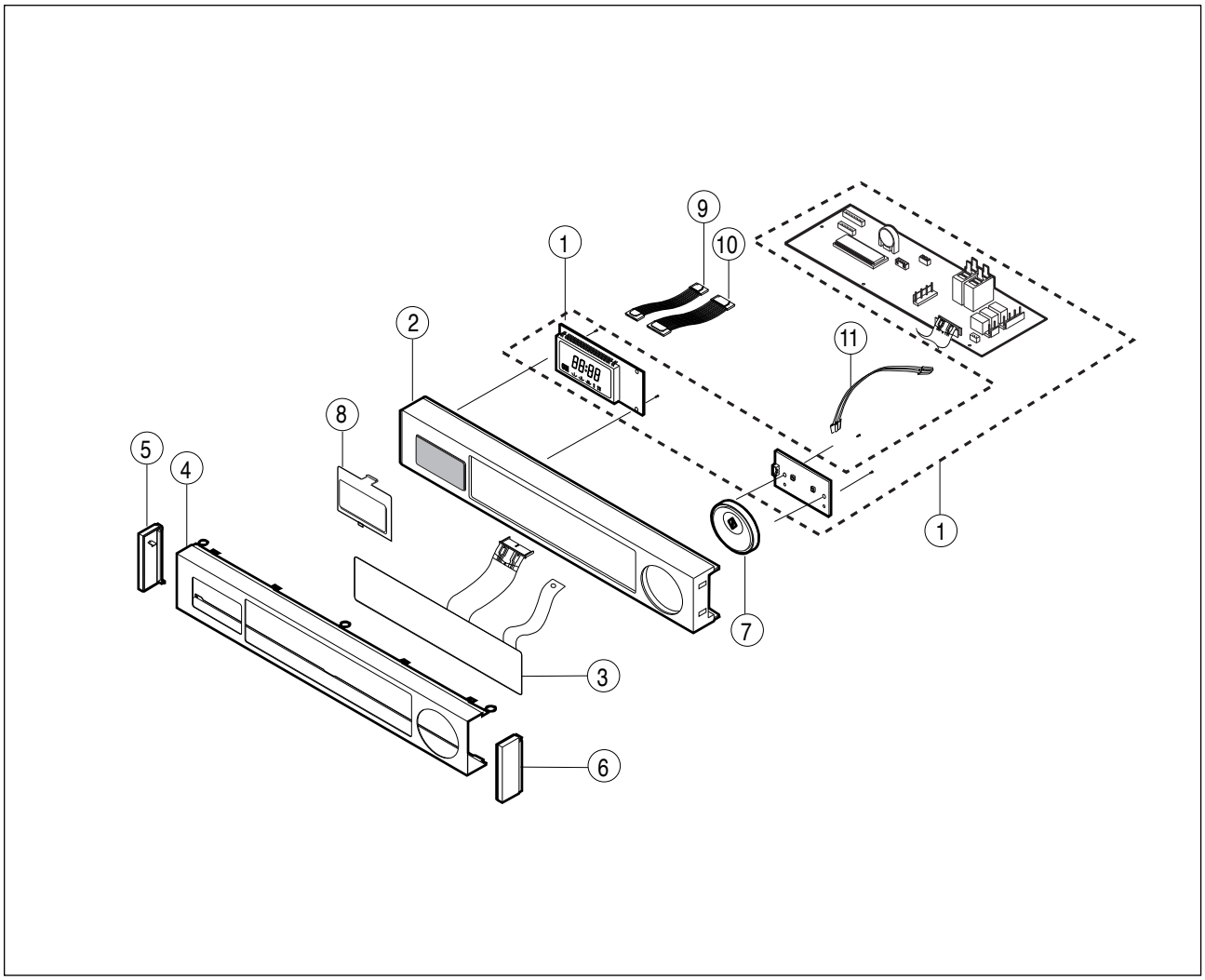
No.	Parts No.	Parts Name	Description/Specification	Q'ty	Remark
1	DE64-40298A	DOOR-C	PP CM1819	1	
2	DE92-50132C	ASSY DOOR-E	CM1019 COATING BLK	1	
3	DE64-90145A	DECORATION-DOOR	ABS CM1819	1	
4	DE67-20174A	SCREEN-DOOR(B)	TEMP-GLASS T3.2	1	
5	DE64-90146A	DECORATION-COV/DOOR	STS CM1819	1	
6	DE64-20128A	HANDLE-BODY	ABS/Nicr COATING CM1019	1	
7	DE71-60433A	COVER-HANDLE	STS430 T0.5 CM1819	1	
8	DE64-40296A	DOOR-KEY	CR3C	2	
9	DE60-60080A	PIN-KEY	A M3.95 L21 STS304 CM-1819	2	
10	DE61-70144A	SPRING-KEY	PI6.5 D0.8 CM1819	2	
11	DE61-80138A	HINGE	SCP1 T3.0 W24.5 L29.5	2	

7-4 Exploded View & Parts List - Control Parts (CM1019)



No.	Parts No.	Parts Name	Description/Specification	Q'ty	Remarks
1	DE97-00052A	ASSY PCB-MAIN	CM1019 230V50Hz VFD	1	
2	DE70-30126A	PANEL-BASE	RESIN-ABS ME CM1819	1	
3	DE71-60427A	COVER-PANEL	STS430 T0.5 ME CM1829	1	
4	DE71-60428B	COVER-PANEL/L	RESIN-ABS CM1819 Ni Cr-COATING	1	
5	DE71-60429B	COVER-PANEL/R	RESIN-ABS CM1819 Ni+Cr COATING	1	
6	DE66-20212A	BUTTON-START	RESIN-ABS CM1819 Ni Cr-platin	1	
7	DE64-10143A	KNOB-POWER	RESIN-ABS CM1819 Ni Cr-platin	1	
8	DE64-10144A	KNOB-TIMER	RESIN-ABS CM1819 Ni Cr-platin	1	
9	DE66-20211B	BUTTON-SELECT	RESIN-ABS CM1829 Ni Cr-platin/30SEC	1	
10	DE67-40161A	WINDOW-DISPLAY	RESIN-PMMA 82555 CM-1819	1	
11	DE39-40695A	WIRE HARNESS-D	230V50Hz CM1819 EUROPE	1	
12	DE39-40694A	WIRE HARNESS-C	230V50Hz CM1819/29 EUROPE	1	
13	DE39-40692A	WIRE HARNESS-B	230V50HZ CM1819/29 EUROPE	1	

7-4 Exploded View & Parts List - Control Parts (CM1029)



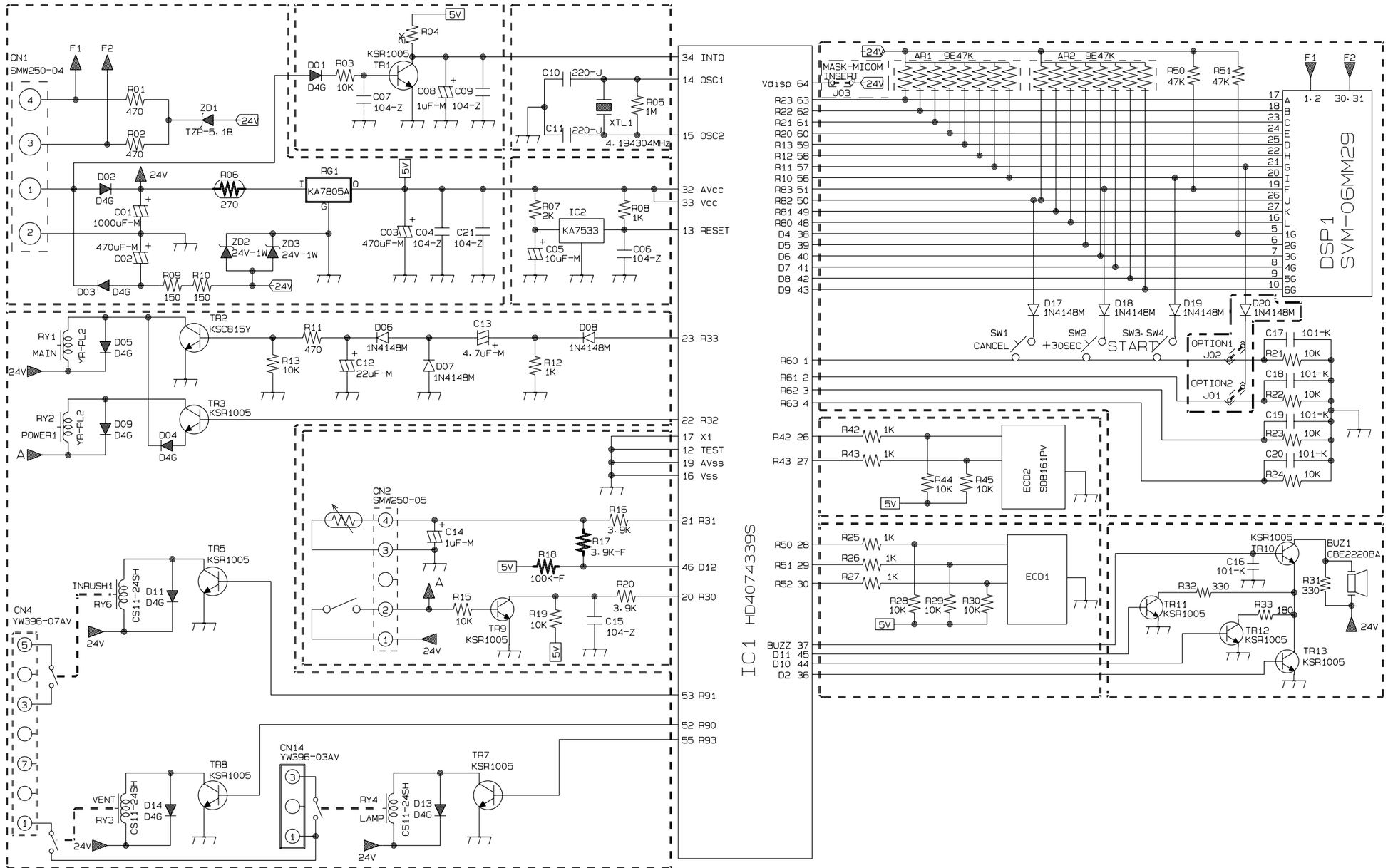
No.	Parts No.	Parts Name	Description/Specification	Q'ty	Remarks
1	DE97-00053A	ASSY PCB-MAIN	CM1029 230V50Hz VFD	1	
2	DE70-30125A	PANEL-BASE	RESIN-ABS TC CM1829	1	
3	DE34-10237B	SWITCH-MEMBRANE	PE-SHEET CM1029 230V0.5A 265X5 200GF	1	
4	DE71-60426A	COVER-PANEL	STS430 T0.5 TC CM1829	1	
5	DE71-60428B	COVER-PANEL/L	RESIN-ABS CM1819 Ni Cr-coating	1	
6	DE71-60429B	COVER-PANEL/R	RESIN-ABS CM1819 Ni+Cr COATING	1	
7	DE66-20212A	BUTTON-START	RESIN-ABS CM1819 Ni Cr-plating	1	
8	DE67-40161A	WINDOW-DISPLAY	RESIN-PMMA 82555 CM-1819	1	
9	DE39-40694A	WIRE HARNESS-C	230V50Hz CM1819/29 EUROPE	1	
10	DE39-40692A	WIRE HARNESS-B	230V50HZ CM1819/29 EUROPE	1	
11	DE39-40113B	WIRE HARNESS-F	100V 50/60HZ RE-CH1	1	

7-6 Parts List - Standard Parts

Parts No.	Parts Name	Description/Specification	Q'ty	Remarks
DE60-10012A	SCREW-TAP TITE	TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	BACK-COVER
DE60-10012A	SCREW-TAP TITE	TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	BKT-LAMP
DE60-10012A	SCREW-TAP TITE	TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	LVT
DE60-10012A	SCREW-TAP TITE	TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	P/C EARTH
DE60-10012A	SCREW-TAP TITE	TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	P/CORD
DE60-10012A	SCREW-TAP TITE	TH + 3 M4 L10 SWR10 ZPC2 TOOTH	1	EARTH
DE60-10022A	SCREW-PH	PH + M3 L8 MSWR10 FEFZY	1	
DE60-10080A	SCREW-WASHER	M5 L12 2S	4	HVT
DE60-10082H	SCREW-A	2S-4X12 TOOTHED	5	
DE60-10082H	SCREW-A	2S-4X12 TOOTHED	2	BODY-LATCH
DE60-10082H	SCREW-A	2S-4X12 TOOTHED	3	C-PANEL
DE60-10088A	SCREW-TAP PH	PH M3 L8 FEFZY PLAIN	4	MAIN PCB
DE60-10088A	SCREW-TAP PH	PH M3 L8 FEFZY PLAIN	4	PCB
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	4	
DE60-10121A	SCREW-TAP TH	2-4X8 FE FZY	2	HANDLE
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	1	BKT-HIN-L
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	1	BKT-HIN-U
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	1	BKT-MOTOR
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	1	DUCT-FAN
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	1	DUCT-MGT-L
DE60-10082H	SCREW-A	2S-4X12 TOOTHED	1	DUCT-FAN
DE60-10098A	SCREW-ASSY TAP TITE	PH TC M4X8 SWRCH18A ZPC2 GLD W	1	MEM EARTH
DE60-10121A	SCREW-TAP TH	2-4X8 FE FZY (77128-540-081 SA	3	DECORATION
DE60-10121A	SCREW-TAP TH	2-4X8 FE FZY (77128-540-081 SA	3	DECORATION
DE60-10196A	SCREW-TAP OH	OH+FH + 4 L8 MSWR18C Ni SIL	3	BASE
DE60-10196A	SCREW-TAP OH	OH+FH + 4 L8 MSWR18C Ni SIL	1	COVER-LAMP
DE60-10196A	SCREW-TAP OH	OH+FH + 4 L8 MSWR18C Ni SIL	6	OUTPANEL
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	2	
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	8	BACK-COVER
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	2	BKT-PCB
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	2	C-RESISTOR
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	4	CAVI-BACK
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	1	DUCT-MGT-L
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	2	DUCT-OVEN
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	7	OUTPANEL
DE60-10197A	SCREW-WASHER	TH(WASHER) + 4 L12 MSWR18C N	2	SUP-FAN
DE60-20021A	BOLT-HEX	MSWR3 TAP 5X12S YELLOW	4	HINGE
DE60-30015A	NUT-FLANGE	M5 P0.8 MSWR10 FEFZY	4	MGT

8. P.C.B Circuit Diagrams and Parts List

8-1 P.C.B Circuit Diagram (CM1019)



MODEL-OPTION			
MODEL	INSERT	DELETE	REMARK
CM1019		D20. J02	CM1819

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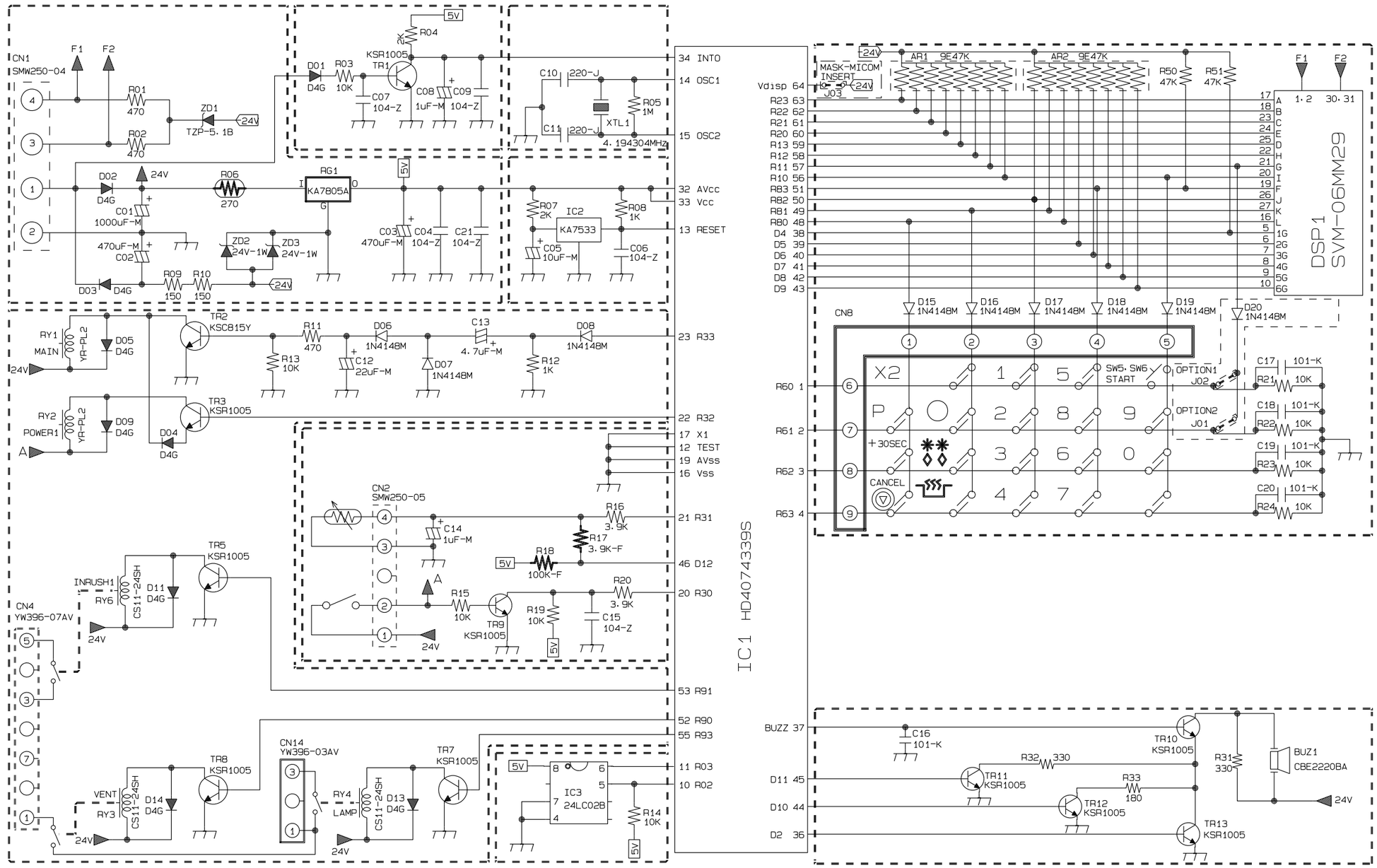
1999. 1. 20

ELECTRIC-DIAGRAM

CM1019

8-2 P.C.B Circuit Diagram (CM1029)



MODEL-OPTION			
MODEL	INSERT	DELETE	REMARK
CM1029		D20. J02	CM1829

정 현 수

1999. 1. 20

ELECTRIC-DIAGRAM

CM1029

8-3 P.C.B Parts List (CM1019)

Parts No.	Parts Name	Description / Specification	Q'ty	Remarks
DE97-00052A	ASSY PCB-MAIN	CM1019 230V50Hz VFD	1	
3002-000198	BUZZER-PIEZO	80dB 4KHz ST	1	BUZ1
3406-000175	SWITCH-ROTARY	28V 10mA DP36T 18.8mm	1	ECD2
3406-001032	SWITCH-ROTARY	28VDC 10mA DP6T 20mm	1	ECD1
3501-001015	RELAY-POWER	24V 21.8mA 16A 1FormA 20mS 10m	2	RY1,2
3501-001016	RELAY-MINIATURE	24V 12.5mA 5A 1FormA 8mS 4mS	3	RY3,4,6
3711-000315	CONNECTOR-HEADER	1WALL 7P 1R 3.96mm STRAIGHT SN	1	CN3
3711-000570	CONNECTOR-HEADER	BOX 10P 1R 2.50mm ANGLE SN	1	CN10
3711-000577	CONNECTOR-HEADER	BOX 10P 1R 2.5mm STRAIGHT SN	1	CN7
3711-000616	CONNECTOR-HEADER	BOX 11P 1R 2.5mm STRAIGHT SN	2	CN12,5
3711-001154	CONNECTOR-HEADER	BOX 9P 1R 2.5mm STRAIGHT SN	2	CN11,6
DE07-10088A	V.F.DISPLAY	SVM-06MM29 REDDISHORG/GRN 6G 5	1	DSP1
DE13-20016A	IC-VOLT REGU	KA7805A TO-220AB 1A 0/125C	1	RG1
DE39-40692A	WIRE HARNESS-B	230V50HZ CM1819/29 EUROPE	1	
DE39-40694A	WIRE HARNESS-C	230V50Hz CM1819/29 EUROPE	1	
DE39-40695A	WIRE HARNESS-D	230V50Hz CM1819 EUROPE	1	
DE61-90178A	HOLDER-DIGITRON	NY66 CM1819	1	DSP1
DE92-00084A	ASSY PCB AUTO-MAIN	230V50Hz VFD CM1019	1	
0401-001002	DIODE-SWITCHING	1N4148M 100V 200mA 500mW 3nS D	6	D6,7,8,17,18,19
0402-000559	DIODE-RECTIFIER	D4G 400V 1A T-1	10	D1~5,9~14
0403-000525	DIODE-ZENER	1N4733A 5.1V 5% 1W DO-41 TP	1	ZD1
0403-000537	DIODE-ZENER	1N4749A 24V 5% 1W DO-41 TP	2	ZD2,3
0501-000388	TR-SMALL SIGNAL	KSC815 NPN 400mW TO-92 BK 120-	1	TR2
0504-001014	TR-DIGITAL	KSR1005 NPN 300mW 4.7K-10K TO-	10	TR1~9,10~13
2001-000003	R-CARBON	330ohm 5% 1/8W AA TP 1.8x3.2mm	2	R31,32
2001-000290	R-CARBON	10Kohm 5% 1/8W AA TP 1.8x3.2mm	8	R3,13,15,19,21~24,
2001-000290	R-CARBON	10Kohm 5% 1/8W AA TP 1.8x3.2mm	5	28~30,44,45
2001-000405	R-CARBON	180ohm 5% 1/8W AA TP 1.8x3.2mm	1	R33
2001-000429	R-CARBON	1Kohm 5% 1/8W AA TP 1.8x3.2mm	5	R8,12,25~27,
2001-000429	R-CARBON	1Kohm 5% 1/8W AA TP 1.8x3.2mm	2	42,43
2001-000435	R-CARBON	1Mohm 5% 1/8W AA TP 1.8x3.2mm	1	R5
2001-000577	R-CARBON	2Kohm 5% 1/8W AA TP 1.8x3.2mm	2	R4,7
2001-000613	R-CARBON	3.9Kohm 5% 1/8W AA TP 1.8x3.2m	2	R16,20
2001-000780	R-CARBON	470ohm 5% 1/8W AA TP 1.8x3.2mm	3	R1,2,11
2001-000786	R-CARBON	47Kohm 5% 1/8W AA TP 1.8x3.2mm	2	R50,51
2001-001077	R-CARBON(S)	150ohm 5% 1/2W AA TP 2.4x6.4mm	2	R09,10
2003-000236	R-METAL OXIDE	270ohm 5% 2W AA TP 6x16mm	1	R06
2004-000195	R-METAL	100Kohm 1% 1/8W AA TP 1.8x3.2m	1	R18
2004-000729	R-METAL	3.9Kohm 1% 1/8W AA TP 1.8x3.2m	1	R17
2011-000582	R-NETWORK	47Kohm 5% 1/8W A SIP 9P TP	2	AR1,2
2202-000121	C-CERAMIC,MLC-AXIAL	100pF 10% 50V Y5P TP 1.9x3.5	5	C16,17,18,19,20
2202-000780	C-CERAMIC,MLC-AXIAL	100nF +80-20% 50V Y5V TP 3.5x1	6	C4,6,7,9,15,21
2202-000205	C-CERAMIC,MLC-AXIAL	22pF 5% 50V SL TP(26mm) 1.9x3.	2	C10,11

8-3 P.C.B Parts List (CM1019 continued)

Parts No.	Parts Name	Description / Specification	Q'ty	Remarks
2401-000180	C-AL	1000uF 20% 35V GP 16x25x7.5m	1	C01
2401-000466	C-AL	10uF 20% 35V GP TP 5x7 5	1	C05
2401-000598	C-AL	1uF 20% 50V GP TP 4x7 5	2	C08,C14
2401-000914	C-AL	22uF 20% 16V TP 5x11 5mm	1	C12
2401-002075	C-AL	22uF 20% 25V GP 5x11mm 5mm	1	C18
2401-001268	C-AL	4.7uF 20% 50V GP 5x11mm 5mm	1	C13
2401-001363	C-AL	470uF 20% 16V GP 10x12.5mm 5	1	C03
2401-001415	C-AL	470uF 20% 35V GP TP 10x16 5mm	1	C02
2801-003214	CRYSTAL-UNIT	4.194304MHz 50ppm 28-AAA 12pF	1	XTL1
3404-000282	SWITCH-TACT	12Vdc 50mA 120+-30gf 6.2x3.6mm	4	SW1,2,3,4
3711-000203	CONNECTOR-HEADER	1WALL 3P 1R 3.96mm ANGLE SN	1	CN14
3711-000940	CONNECTOR-HEADER	BOX 4P 1R 2.5mm STRAIGHT SN	1	CN1
3711-000999	CONNECTOR-HEADER	BOX 5P 1R 2.50mm STRAIGHT SN	1	CN2
DE13-20009A	IC	KA7533 DIP	1	IC2
DE39-60001A	WIRE-SO COPPER	PI0.6 SN T 52MM TAPING_WIRE	32	J4~38
DE41-10441A	P.C.B-MAIN	FR-1 T1.6 W197 L296 CM-1819	1	

8-4 P.C.B Parts List (CM1029)

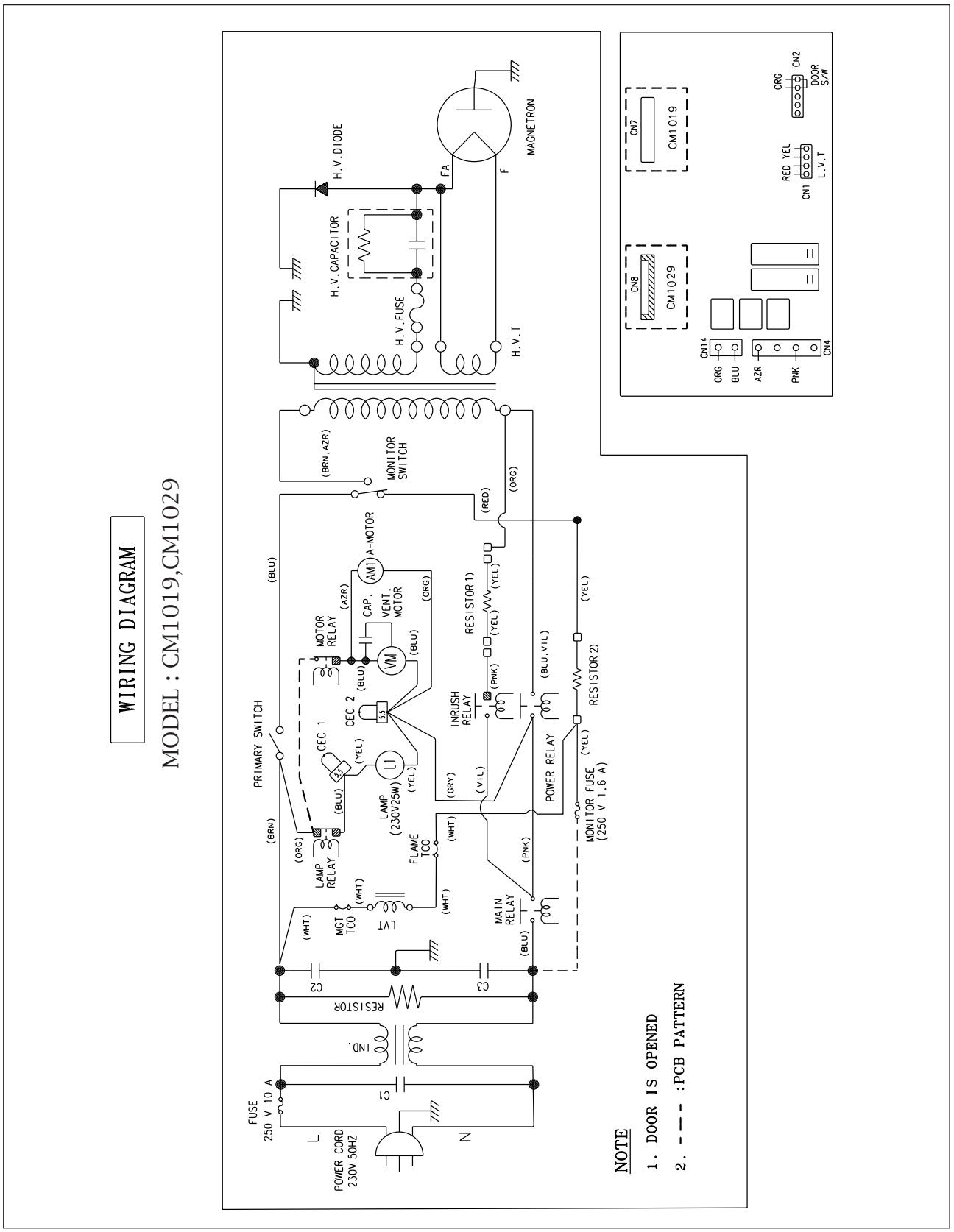
Parts No.	Parts Name	Description / Specification	Q'ty	Remarks
DE91-00053A	ASSY PCB-MAIN	CM1029 230V50Hz VFD	1	
3002-000198	BUZZER-PIEZO	80dB 4KHz ST	1	BUZ1
3501-001015	RELAY-POWER	24V 21.8mA 16A 1FormA 20mS 10m	2	RY1,2
3501-001016	RELAY-MINIATURE	24V 12.5mA 5A 1FormA 8mS 4mS	3	RY3,4,6
3708-000525	CONNECTOR-FPC/FC/PIC	10P 2.54mm STRAIGHT SN	1	CN8
3711-000315	CONNECTOR-HEADER	1WALL 7P 1R 3.96mm STRAIGHT SN	1	CN4
3711-000616	CONNECTOR-HEADER	BOX 11P 1R 2.5mm STRAIGHT SN	2	CN12,5
3711-001154	CONNECTOR-HEADER	BOX 9P 1R 2.5mm STRAIGHT SN	2	CN11,6
DE07-10088A	V.F.DISPLAY	SVM-06MM29 REDDISHORG/GRN 6G 5	1	DSP1
DE13-20016A	IC-VOLT REGU	KA7805A TO-220AB 1A 0/125C	1	RG1
DE39-40113B	WIRE HARNESS-F	100V 50/60HZ RE-CH1	1	
DE39-40692A	WIRE HARNESS-B	230V50HZ CM1819/29 EUROPE	1	
DE39-40694A	WIRE HARNESS-C	230V50Hz CM1819/29 EUROPE	1	
DE61-90178A	HOLDER-DIGITRON	NY66 CM1819	1	DSP1
DE92-00085A	ASSY PCB AUTO-MAIN	230V50Hz VFD CM1029	1	
0401-001025	DIODE-SWITCHING	1N4148M 100V 200mA 500mW 3nS D	8	D6,7,8,15~19
0402-000137	DIODE-RECTIFIER	1N4007 1000V 1A DO-41 TP	2	D21,22
0402-000559	DIODE-RECTIFIER	D4G 400V 1A T-1	9	D1~5,9~14
0403-000525	DIODE-ZENER	1N4733A 5.1V 5% 1W DO-41 TP	1	ZD1
0403-000537	DIODE-ZENER	1N4749A 24V 5% 1W DO-41 TP	11	ZD2,3
0501-000388	TR-SMALL SIGNAL	KSC815 NPN 400mW TO-92 BK 120-	1	TR2
0504-001014	TR-DIGITAL	KSR1005 NPN 300mW 4.7K-10K TO-	10	TR1,3~13
1103-001107	IC-EEPROM	24LC02B 256x8BIT DIP 8P 300MIL	1	IC3
2001-000003	R-CARBON	330ohm 5% 1/8W AA TP 1.8x3.2mm	11	R31,32
2001-000290	R-CARBON	10Kohm 5% 1/8W AA TP 1.8x3.2mm	5	R3,13~15,19
2001-000290	R-CARBON	10Kohm 5% 1/8W AA TP 1.8x3.2mm	4	21~24
2001-000405	R-CARBON	180ohm 5% 1/8W AA TP 1.8x3.2mm	1	R33
2001-000429	R-CARBON	1Kohm 5% 1/8W AA TP 1.8x3.2mm	2	R08,12
2001-000435	R-CARBON	1Mohm 5% 1/8W AA TP 1.8x3.2mm	1	R05
2001-000577	R-CARBON	2Kohm 5% 1/8W AA TP 1.8x3.2mm	2	R04,07
2001-000613	R-CARBON	3.9Kohm 5% 1/8W AA TP 1.8x3.2m	2	R16,20
2001-000780	R-CARBON	470ohm 5% 1/8W AA TP 1.8x3.2mm	3	R01,02,11
2001-000786	R-CARBON	47Kohm 5% 1/8W AA TP 1.8x3.2mm	2	R50,51
2001-001077	R-CARBON(S)	150ohm 5% 1/2W AA TP 2.4x6.4mm	2	R09,10
2003-000236	R-METAL OXIDE	270ohm 5% 2W AA TP 6x16mm	1	R06
2004-000195	R-METAL	100Kohm 1% 1/8W AA TP 1.8x3.2m	1	R18
2004-000729	R-METAL	3.9Kohm 1% 1/8W AA TP 1.8x3.2m	1	R17
2011-000582	R-NETWORK	47Kohm 5% 1/8W A SIP 9P TP	2	AR1,2
2202-000121	C-CERAMIC,MLC-AXIAL	100pF 10% 50V Y5P TP 1.9x3.5	5	C16~20
2202-000780	C-CERAMIC,MLC-AXIAL	100nF +80-20% 50V Y5V TP 3.5x1	6	C04,6,7,9,15,21
2202-000205	C-CERAMIC,MLC-AXIAL	22pF 5% 50V SL TP(26mm) 1.9x3.	2	C10,11

8-4 P.C.B Parts List (CM1029 continued)

Parts No.	Parts Name	Description / Specification	Q'ty	Remarks
2401-000180	C-AL	1000uF 20% 35V GP 16x25x7.5m	1	C01
2401-000466	C-AL	10uF 20% 35V GP TP 5x7 5	1	C05
2401-000598	C-AL	1uF 20% 50V GP TP 4x7 5	2	C08,14
2401-000914	C-AL	22uF 20% 16V TP 5x11 5mm	1	C12
2401-000941	C-AL	22uF 20% 25V GP 5x11mm 5mm	1	C18
2401-002075	C-AL	4.7uF 20% 50V GP 5x11mm 5mm	1	C13
2401-001363	C-AL	470uF 20% 16V GP 10x12.5mm 5	1	C03
2401-001415	C-AL	470uF 20% 35V GP TP 10x16 5mm	1	C02
2801-003214	CRYSTAL-UNIT	4.194304MHz 50ppm 28-AAA 12pF	1	XTL1
3404-000282	SWITCH-TACT	12Vdc 50mA 120+-30gf 6.2x3.6mm	2	SW5,6
3711-000203	CONNECTOR-HEADER	1WALL 3P 1R 3.96mm ANGLE SN	1	CN14
3711-000881	CONNECTOR-HEADER	BOX 3P 1R 2.5mm STRAIGHT SN	2	CN13,9
3711-000940	CONNECTOR-HEADER	BOX 4P 1R 2.5mm STRAIGHT SN	1	CN1
3711-000999	CONNECTOR-HEADER	BOX 5P 1R 2.50mm STRAIGHT SN	1	CN2
DE13-20009A	IC	KA7533 DIP	1	IC2
DE39-60001A	WIRE-SO COPPER	PI0.6 SN T 52MM TAPING_WIRE	31	J04~06,08~38
DE41-10441A	P.C.B-MAIN	FR-1 T1.6 W197 L296 CM-1819	1	

9. Wiring Diagram & Operating Sequence

9-1 Wiring Diagram (CM1019/1029)

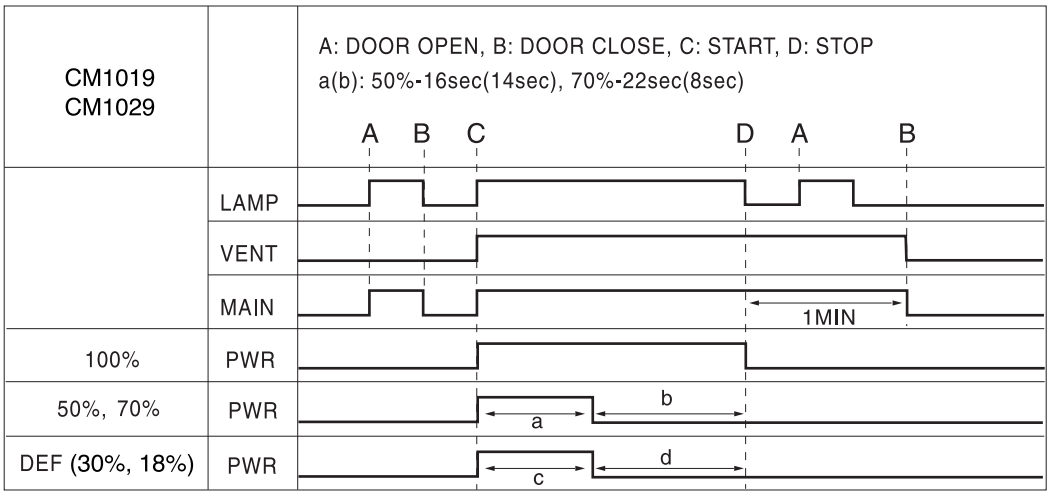


9-2 Description of Operating Sequence

When the oven is set to power level of 100%, 70% or 50% and Def. level 30% or 18%

When the oven is operating under the power level of 100%, 70% or 50% and Def. level 30% or 18% the coil of power relay are energized intermittently by ON and OFF cycle of 30 seconds in order to supply power source to the High Voltage Transformer and thus to oscillate the magnetron.

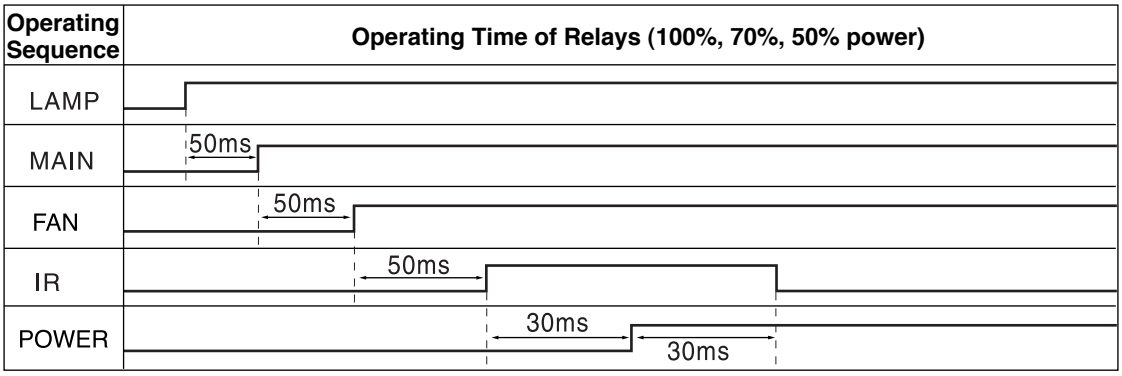
The relation between indications on the display window and the output power of the microwave oven is as shown in figure below.



Note : One second inclued as a time for starttng the magnetron oscillation.

9-2 Description of Operating Sequence (continued)

Initial operating status of Power Relay when the START button is pressed.



Note : LAMP: Lamp Relay (250V 5A)
MAIN : Main Relay (250V 16A)
FAN : Fan Motor Relay (250V 5A)
IR : Inrush Relay (250V 5A)
POWER : Power Relay (250V 16A)